SCHOOL OF CIVIL ENGINEERING

INDIANA DEPARTMENT OF TRANSPORTATION

JOINT HIGHWAY RESEARCH PROJECT
JHRP-91-4

ENGINEERING SOILS MAP OF JAY COUNTY, INDIANA
FINAL REPORT

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Final Report
ENGINEERING SOILS MAP OF JAY COUNTY, INDIANA

TO:	H.L. Michael, Director Joint Highway Research Project	January 8, 1991 Project: C-36-51B
FROM:	C.W. Lovell, Research Engineer Joint Highway Research Project	File: 1-5-2-88

The attached report entitled "Engineering Soils Map of Jay County, Indiana," completes a portion of the long-term project concerned with the development of county engineering soils maps of the 92 counties in the State of Indiana. This report, the 88th report of the series, was prepared by Arvind Chaturvedi and Andrew Garrigus, Research Assistants, Joint Highway Research Project, under my direction.

The soils mapping of Jay County was done primarily by the analysis of landforms and associated parent materials as portrayed on stereoscopic aerial photographs. Valuable information for soils was obtained from publications of the Soil Conservation Service, United States Department of Agriculture. Test data from roadway and bridge projects was obtained from the Indiana Department of Transportation. Soil profiles for the landform/parent material areas mapped are presented on the engineering soils map, a copy of which is included at the end of the report.

Respectfully submitted,

C.W. Lovell

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CWL/cak

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FINAL REPORT

ENGINEERING SOILS MAP OF JAY COUNTY, INDIANA

by

Arvind Chaturvedi and Andrew Garrigus
Research Assistants

Joint Highway Research Project

Project No.: C-36-51B

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Thanks are also due Professor H. L. Michael, Director, Joint Highway Research Project, and the other members of the Joint Highway Research Board for their continued support of the county soil mapping project.

Drafting of the Engineering Soils Map of Jay County, and other figures included in this report, was skillfully done by Mei Zhang and D. Yang and is gratefully acknowledged. Thanks also go to Cheryl Burroughs for painstakingly typing the classification test results presented in Appendix A of this report.

Last, but not the least, special thanks to William B. McDermott and Marian Sipes for their help in formatting the text and final preparation of this report.

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ENGINEERING SOILS MAP

OF

JAY COUNTY, INDIANA

INTRODUCTION

The engineering soils map of Jay County, Indiana which accompanies this report was prepared by airphoto interpretation techniques using accepted principles of observation and inference. The 7 inch x 9 inch aerial photographs used in this study, having an approximate scale of 1:20,000, were taken in the summer of 1940 for the United States Department of Agriculture and were purchased from that agency. The attached engineering soils map was prepared at a scale ratio of 1:63,360 (1 inch = 1 mile).

Standard symbols developed by the staff of the Airphoto Interpretation Laboratory, School of Civil Engineering, Purdue University, were employed to delineate landform-parent material associations and soil textures. The text of this report represents an effort to overcome the limitations imposed by adherence to a standard symbolism and map presentation.

Extensive use was made of the Agricultural Soil Survey of Jay County published in 1986 (1).* It was particularly useful as a cross-reference to check soil boundaries and in locating gravel pits, ponds, etc. not present on the 1940 aerial photographs. Also, a reconnaisance field trip was made to the county in the earlier stages of the work.

The map and report are part of a continuing effort to complete a comprehensive soil survey for the state of Indiana. Therefore, a consistent mapping of soil units at the boundary of the previously mapped Adams, Blackford, and Delaware, counties was attempted; the other adjacent counties, Wells and Randolph are as yet unmapped at the time of writing this report.

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* Numbers in parentheses refer to list of references.

Included on the map is a set of subsurface profiles which illustrate the approximate variations that are expected in the general soil profiles of the major soils of each landform-parent material area. The profiles were constructed from information obtained from agricultural literature and from boring data collected from roadway and bridge site investigations (25 - 42). Boring locations are shown on the map. Appendix A contains a summary of classification test results for these locations.

The text of this report supplements the engineering soils map and includes a general description of the study area, descriptions of the different landform-parent material regions, and a discussion of the engineering considerations associated with the soils found in Jay County.

The predominant soils associated with each landform-parent material classification are covered in the discussion of the different landforms in the county. The physical, chemical, and engineering index properties of these soils are included in Appendices B and C.

DESCRIPTION OF THE AREA

GENERAL

Jay County is located in east-central Indiana as shown in Figure 1. Jay County is bounded on the south by Randolph County, to the west by Blackford and Delaware counties, and to the north by Adams and Wells counties. The First Principal Meridian forms the eastern boundary with the State of Ohio. Portland is the county seat of Jay County and is located along the Salamonie River in the central part of the county.

Jay County is nearly rectangular in shape. It averages about 21 miles long (east-west) and is about 18 miles wide (north-south). The county covers an area of approximately 370 square miles (245,786 acres) (1,2).

There are 63 miles of federal and state roads and about 802 miles of county roads in Jay County (1). Many of the county roads are paved, whereas the remaining have a gravel surface. A municipal airport is located at Portland, and there are several private landing strips in Jay County (1).

In 1980, the population of Jay County was 23,239. This was a 1.43 percent decrease from the 1970 population. A population summary of the major towns and cities in Jay County is given in Table 1.

Approximately 76 percent of Jay County is actively farmed, with corn, soybeans, and small grain being the principal crops (1). Beef, hogs, and dairy operations are the major source of income for livestock farmers in Jay County (1). Although there are several small business establishments in Jay County, many people commute to nearby Muncie and Marion for work (1).

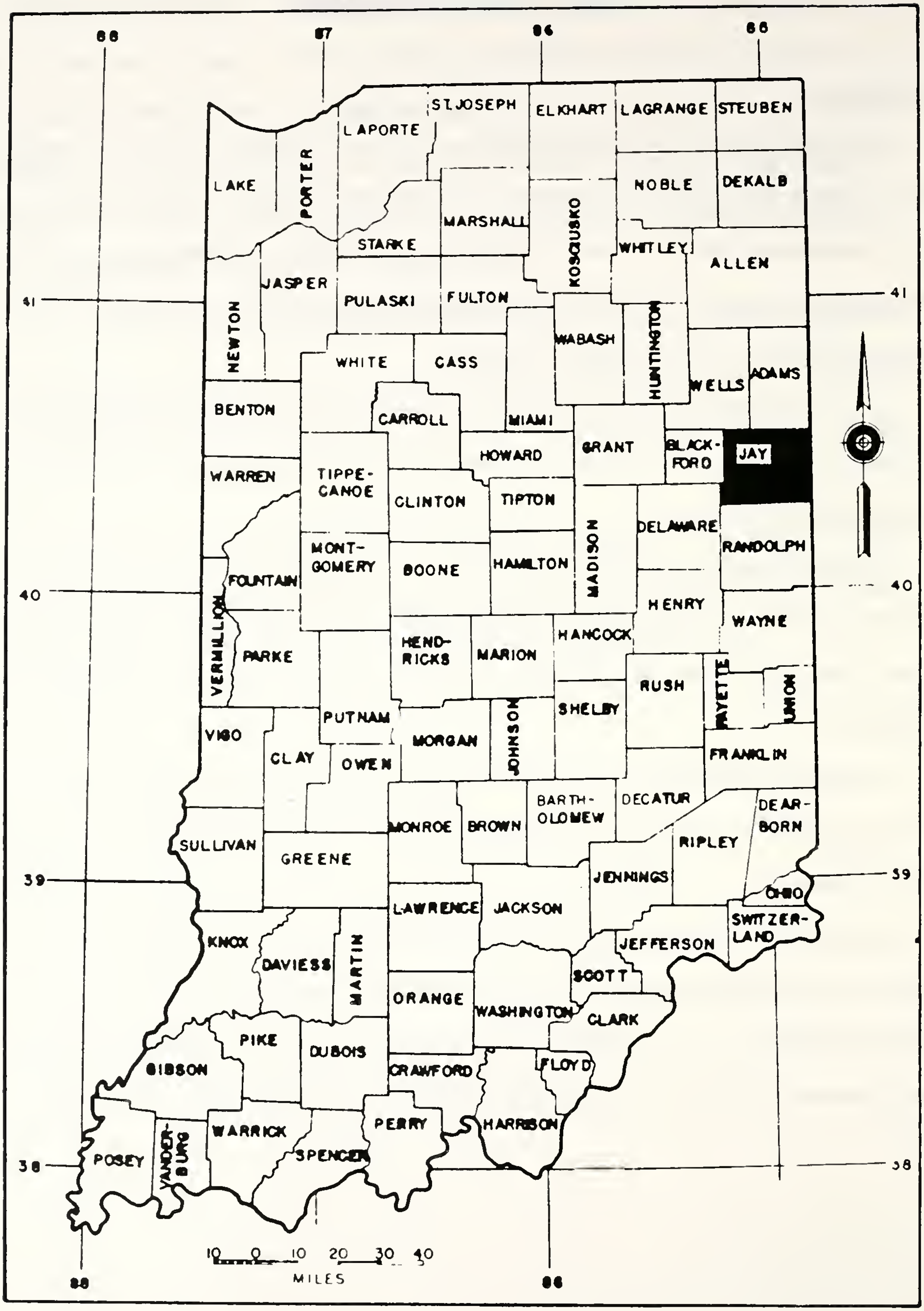


FIGURE 1. LOCATION MAP OF JAY COUNTY

Table 1. Population Summary of Jay County (3)

City-Town	Population 1980 Census	Population 1970 Census	Population Change (1970-1980) Difference	Population Change (1970-1980) % Change
Bryant	277	320	-43	-13.44
Dunkirk and Blackford	3,180	3,465	-285	-8.23
Pennville	805	798	7	0.88
Portland	7,074	7,115	-41	-0.58
Redkey	1,537	1,667	-130	-7.80
Salamonia	147	162	-15	-9.26
Urban Areas	13,020	13,527	-507	-3.75
Rural Areas	10,219	10,048	171	1.70
County Total	23,239	23,575	-336	-1.43

CLIMATE

Jay County is located in a region of temperate climate and experiences hot humid summers and cold winters. Tables 2 and 3 contain data on precipitation and temperature for the area as recorded in Berne, Indiana for the period 1951 to 1980.

The average temperature for summer is 72 degrees F with an average daily maximum temperature of 84 degrees F. The highest temperature ever recorded is 101 degrees F. The average temperature for winter is 28 degrees F, with a record low being -18 degrees F (1).

The total annual precipitation is 36.36 inches, of which sixty percent falls between April and September. The average seasonal snowfall is 29 inches. Thunderstorms may occur on nearly 40 days in each year. Severe thunderstorms and tornados also occur occasionally and can result in damage to people and property. The prevailing wind is from the southwest and attains a maximum average speed of 12 mph during spring (1). The average relative humidity in midafternoon is approximately 60 percent.

Table 2. Climatological Summary For Jay County (16)

For The Period 1980 - 1988				
	Temperature (°F)			Average Precipitation
MONTH	MAX	MIN	AVERAGE	(inches)
January	31.2	17.0	24.1	1.37
February	36.9	20.3	28.6	1.98
March	49.0	29.2	39.1	2.77
April	60.9	39.8	50.4	3.09
May	73.1	51.1	62.1	3.31
June	81.2	59.8	70.5	5.00
July	85.8	65.0	75.4	3.45
August	83.5	62.9	73.2	3.22
September	76.9	55.3	66.1	2.31
October	61.5	43.2	52.4	2.68
November	50.9	34.6	42.8	3.61
December	37.1	23.6	30.4	2.77

Table 3. Thirty Year Normal Climate Data (16)

For The Period 1951 - 1980				
	Temperature (°F)			Average Precipitation
MONTH	MAX	MIN	AVERAGE	(inches)
January	33.0	17.4	25.2	2.30
February	36.8	19.8	28.3	2.06
March	47.4	28.9	38.2	3.28
April	61.4	39.7	50.6	3.90
May	72.6	49.6	61.1	3.56
June	82.1	58.8	70.5	4.15
July	85.3	62.8	74.0	3.80
August	83.7	60.7	72.2	3.19
September	77.6	54.0	65.8	3.24
October	65.5	42.9	54.2	2.46
November	49.7	33.0	41.4	2.74
December	37.9	23.1	30.5	2.65
Annual	61.1	40.9	51.0	37.33

DRAINAGE FEATURES

Figure 2 is the "Drainage Map of Jay County, Indiana" prepared in 1953 by the staff of the Joint Highway Research Project (JHRP) at Purdue University. As illustrated in Figure 3, Jay County lies entirely within the Wabash River watershed of Indiana. Although the Wabash River touches the northeastern part of Jay County, the Salamonie River is still regarded as the principal stream in Jay County (2). The Salamonie River arises in the east-central part of Jay County, flows northwesterly past Portland and Pennville, and enters Blackford County.

The Salamonie River drains the central part of Jay County from the southeastern part of the county to the northwestern portion (2). The northern part of Jay County is drained by Loblolly Creek, Wolf Creek, Campbell Ditch, Bear Creek, and Limberlost Creek which flow into the Wabash River in Adams County. The southern part of Jay County is drained in a southerly direction by Jordon Creek and Days Creek into Randolph County, and in a westerly direction by Halfway Creek into Delaware County (2).

The drainage patterns of Jay County can be classified into three groups. Along the northern slope of the Mississinewa ridge moraine, subparallel drainage pattern is seen (2,4). Broadly subdendritic drainage patterns are recognized along the broad plain of the Salamonie River and its tributaries. The remaining areas exhibit a subdendritic drainage pattern (2). Although many dredged ditches show a rectilinear pattern, they have only a minor effect on the overall drainage patterns of Jay County (2).

Although there are no natural lakes in Jay County, a number of ponds do exist as a result of gravel pit borrow and farm practice (2). A distinct glacial drainageway also exists as a marked ancient river in the northwestern quarter of Jay County (2), and is now drained by Loblolly Creek and Hains Creek.

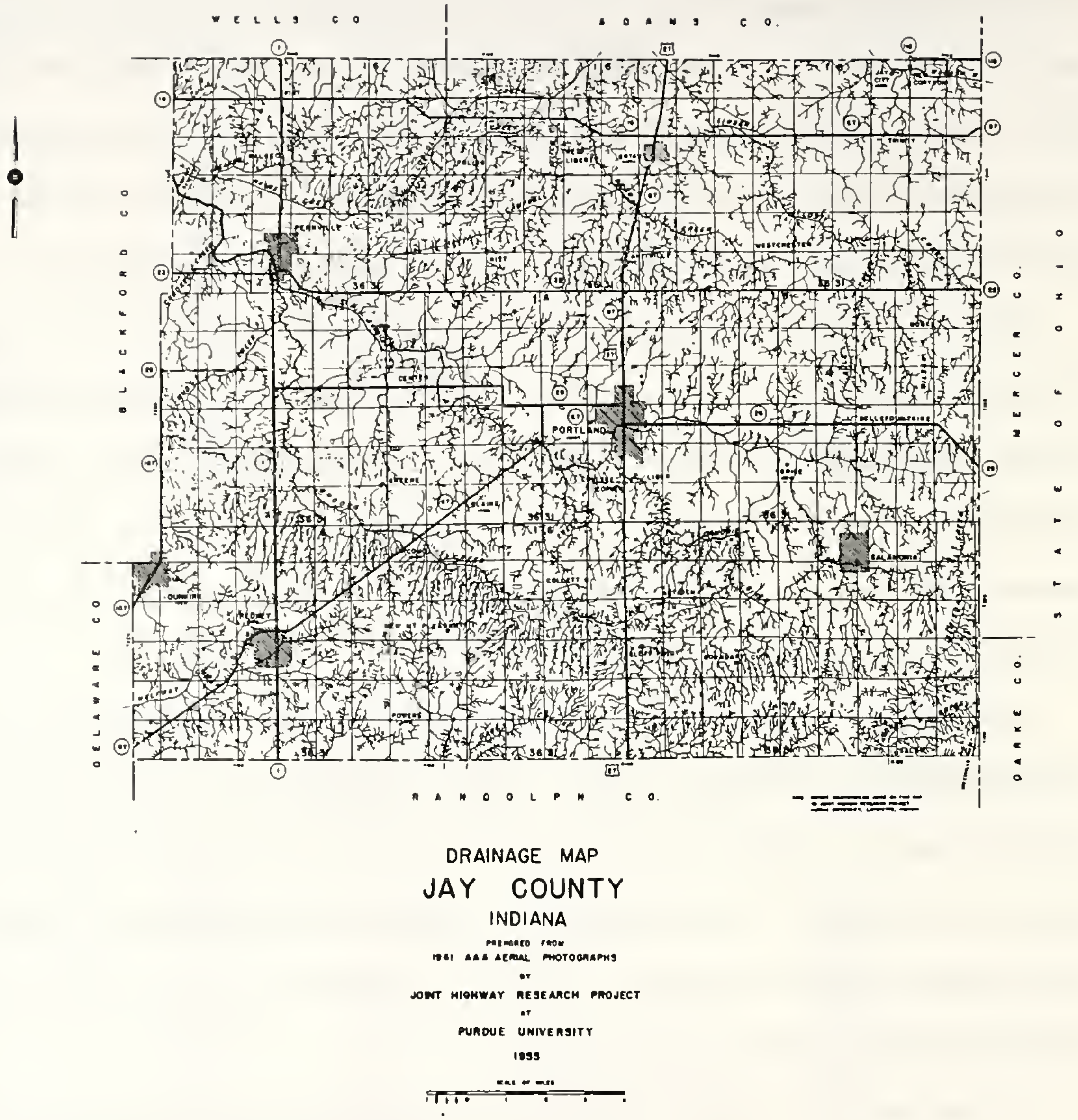


FIGURE 2. DRAINAGE MAP OF JAY COUNTY (17)

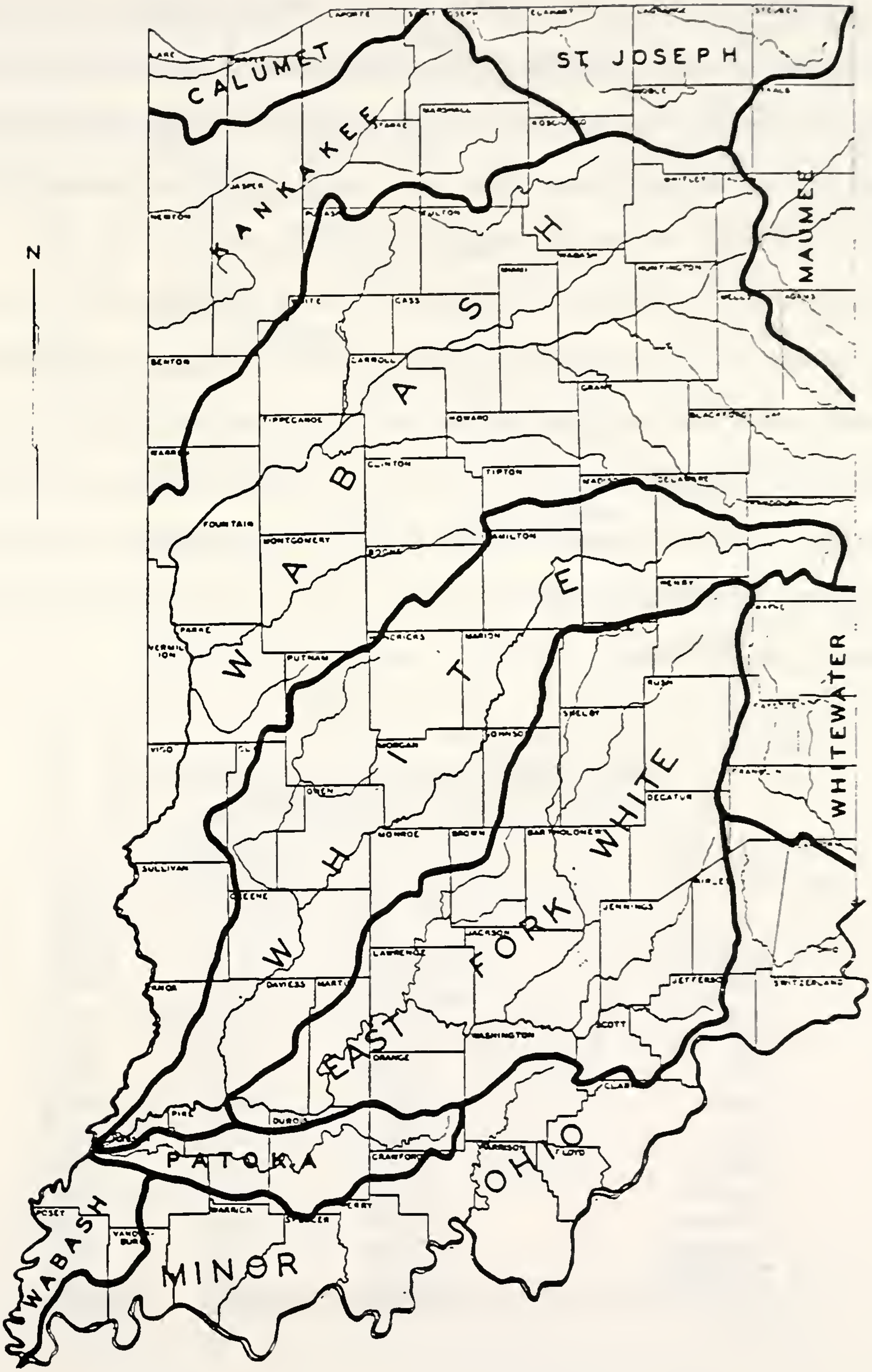


FIGURE 3. MAJOR WATERSHEDS OF INDIANA (18)

WATER SUPPLY

Jay County is located in the Northern Till Plain Section of Indiana as shown in Figure 4. The major source of water supply in Jay County is groundwater, most of which is contained in an aquifer located below 150 feet of glacial drift. This aquifer consists of gravel and sand which contain large quantities of water. Wells drilled into the underlying limestone bedrock yield sufficient quantities of water only if voids or fractures are present (1).

Another major aquifer in the northwestern part of Jay County exists in the form of a pre-Pleistocene river valley known as the Teays Valley. This sub-terranean valley trends east-west, is filled with sand and gravel, and occurs below the glacial drift. Wells drilled into this aquifer yield abundant quantities of water, and are usually 400 feet deep. Surface water from streams is also used to augment the ground water supply in parts of Jay County.

The water use summary for Jay County for 1988, a year of drought throughout the Midwest, is given in Table 4.

Table 4. Water Use Summary for Jay County (5)
(1988 usage in millions of gallons)

MONTH	SOURCE		
	Ground	Surface	Total
January	61.62	12.87	74.49
February	65.44	14.78	80.23
March	67.76	17.82	85.58
April	72.82	12.47	85.29
May	86.73	9.57	96.30
June	87.56	10.36	97.93
July	78.97	12.67	91.64
August	87.40	11.42	98.81
September	84.36	14.59	98.94
October	72.65	11.02	83.67
November	72.06	18.08	90.14
December	88.51	13.79	102.31
Total	925.88	159.46	1085.33

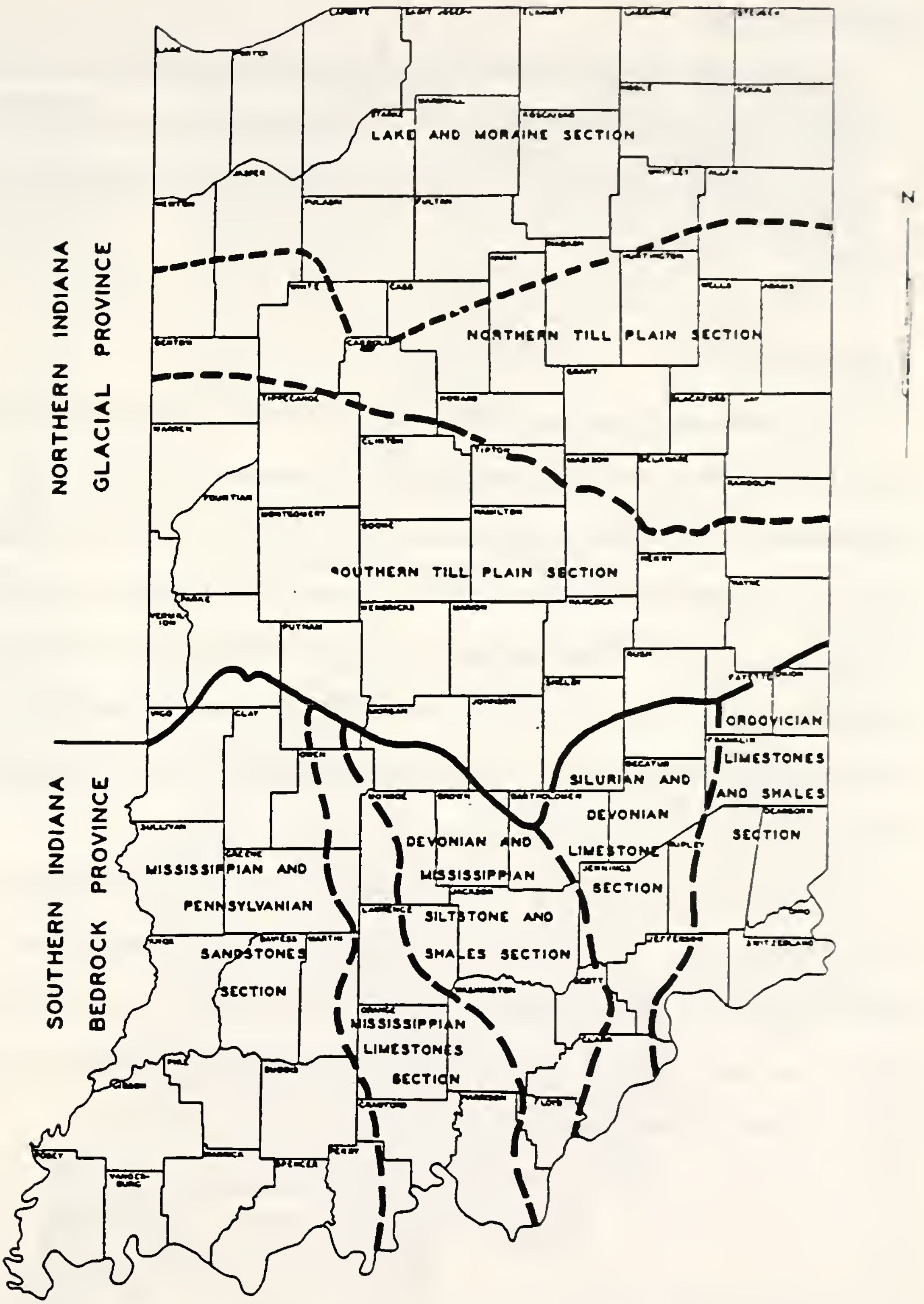


FIGURE 4. GROUNDWATER SECTIONS OF INDIANA (18)

PHYSIOGRAPHY

Jay County lies entirely within the Tipton Till Plain physiographic subsection of the State of Indiana, as is shown in Figure 5. In respect to its physiographic situation in the United States, Jay County is located within the Central Till Plains Section of the Central Lowlands and Plains Province (6).

TOPOGRAPHY

The topography of Jay County is characterized by nearly level to gently undulating areas occurring between the two ridge moraines present in the county (Figure 6). About half of the area of Jay County is covered by ground moraine, with the remainder being occupied by ridge moraines, flood plains, and terraces. The Salamonie ridge moraine that traverses the the central part of Jay County is characterized by inconspicuous swells (2). The Mississinewa ridge moraine, occurring in the southern part of the county, also shows gentle swells and undulations (2). The ridge moraines rise so slowly that the boundary between the ridge and ground moraines is not conspicuous.

The average elevation of Jay County is approximately 945 feet. The highest point in the county is about 1,121 feet above sea level, and occurs near the southeastern corner of Jay County. The lowest elevation is about 845 feet above sea level, in an area where Loblolly Creek leaves Jay County, north of the town of Bryant (1). The maximum local relief in Jay County is about 100 feet (2,8).

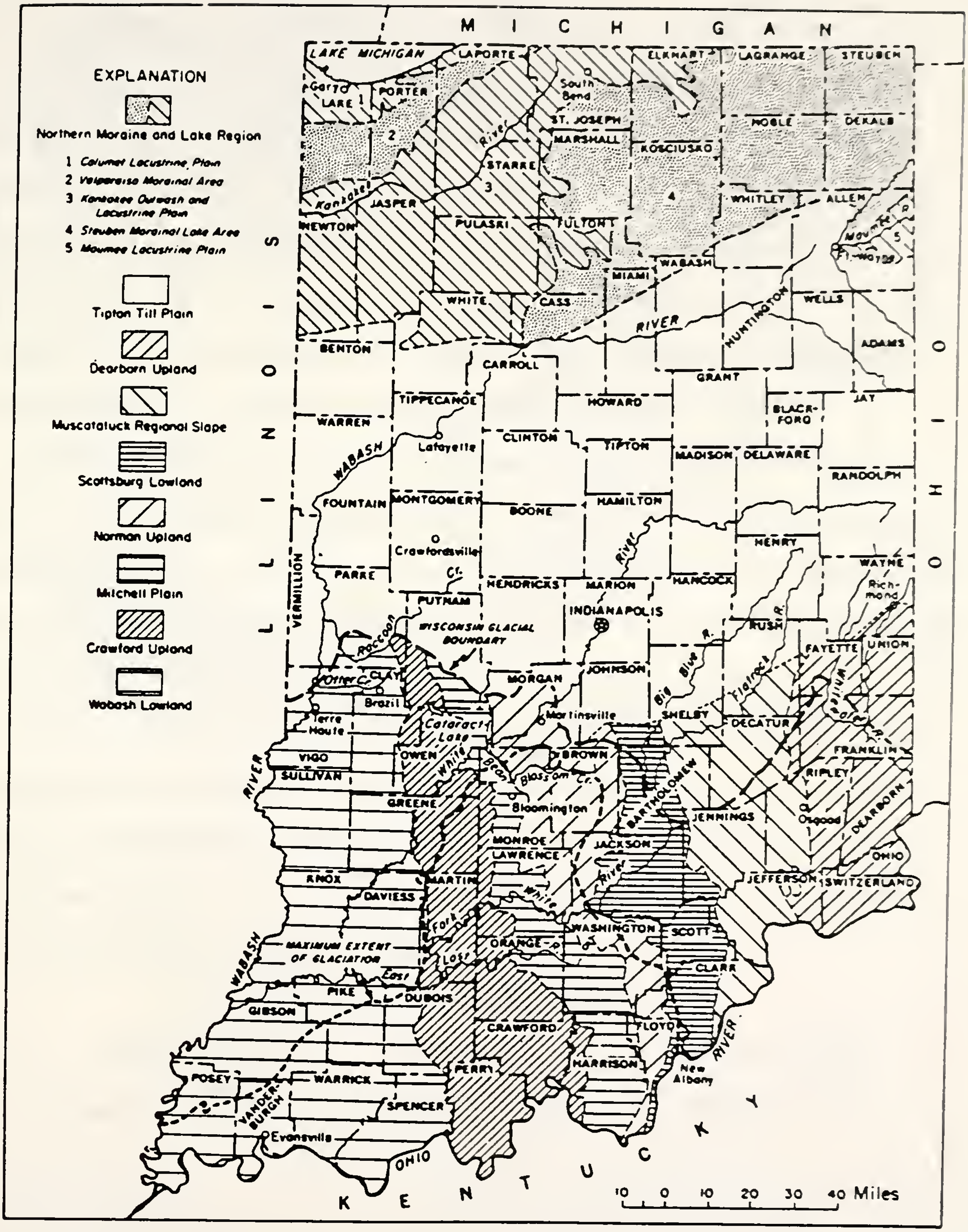


FIGURE 5. PHYSIOGRAPHIC UNITS AND GLACIAL BOUNDARIES IN INDIANA (19)

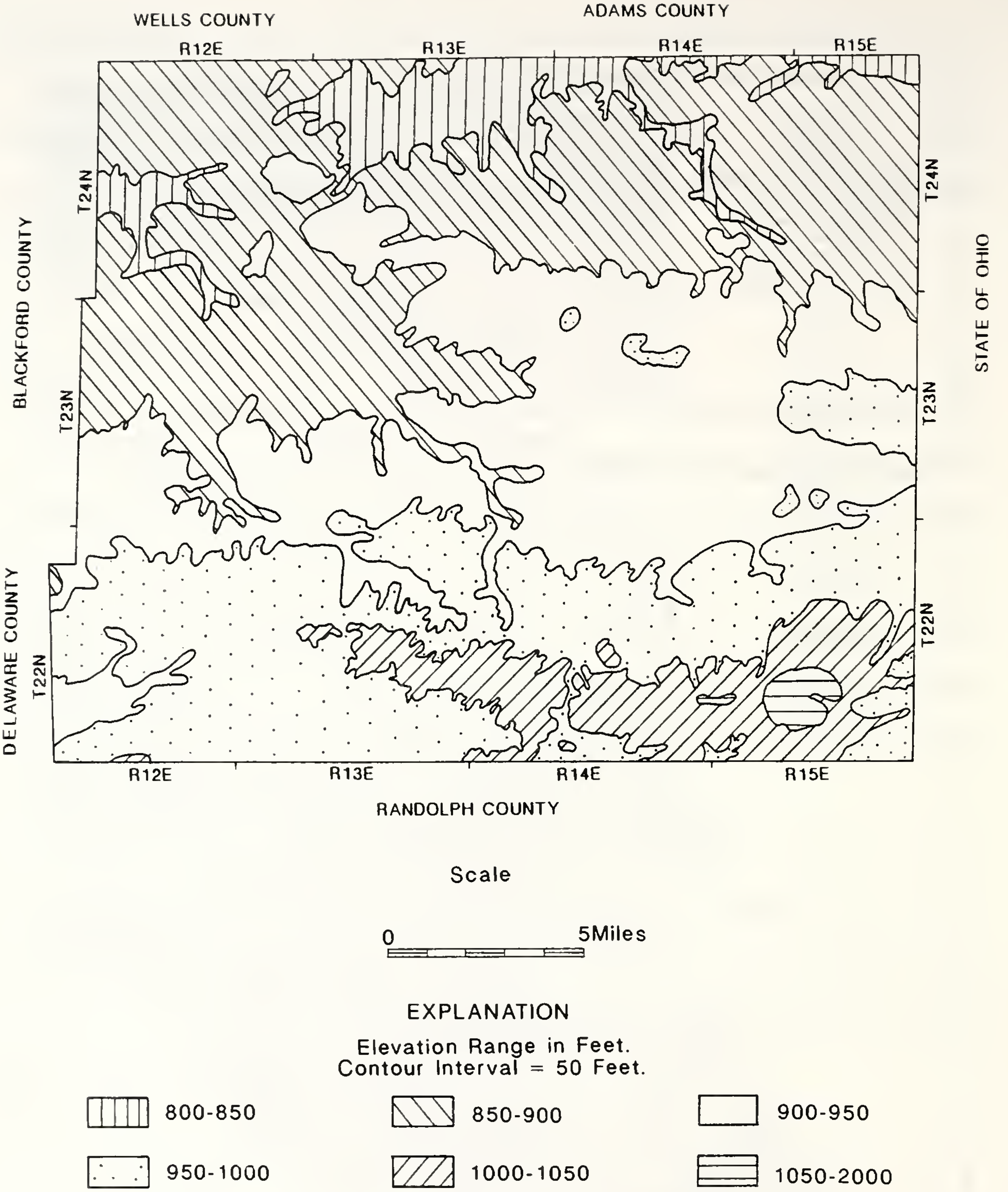


FIGURE 6. TOPOGRAPHIC MAP OF JAY COUNTY (20)

GEOLOGY OF JAY COUNTY

Jay County is located on the northern flank of the Cincinnati Arch, which is a broad crestal feature that extends from east-central Indiana northwestward to Lake County, Indiana. The crestal area of the arch exhibits low dips, whereas the dip is 35 feet or more per mile on the flanks of the arch. To the northeast and southwest of the Cincinnati Arch are the flanks of two large structural depressions, the Michigan Basin and the Illinois Basin. Dip from the flank of the arch into these basins is approximately 35 feet per mile. These structural features have had a major influence on the outcrop patterns of Silurian formations in the area (11).

The near surface and surface geology of Jay County consists of bedrock of Silurian age (Figure 7), and unconsolidated materials of the Quaternary period. The bedrock surface in Jay County is covered by unconsolidated gravel, sand, silt, and clay deposited during the Pleistocene continental glaciation. The glacial deposits along the flood plains of the Salamonie River and its major tributaries are covered by thin deposits of Recent alluvium.

The bedrock underlying the glacial drift consists of about 400 feet of shale, limestone, dolomitic limestone, and dolomite of Middle Silurian age. These rocks, in turn, are underlain by a series of calcareous shales and thin-bedded impure limestones which are about 700 feet thick and are Ordovician in age. Older rocks of Ordovician and Cambrian ages are encountered at still greater depths.

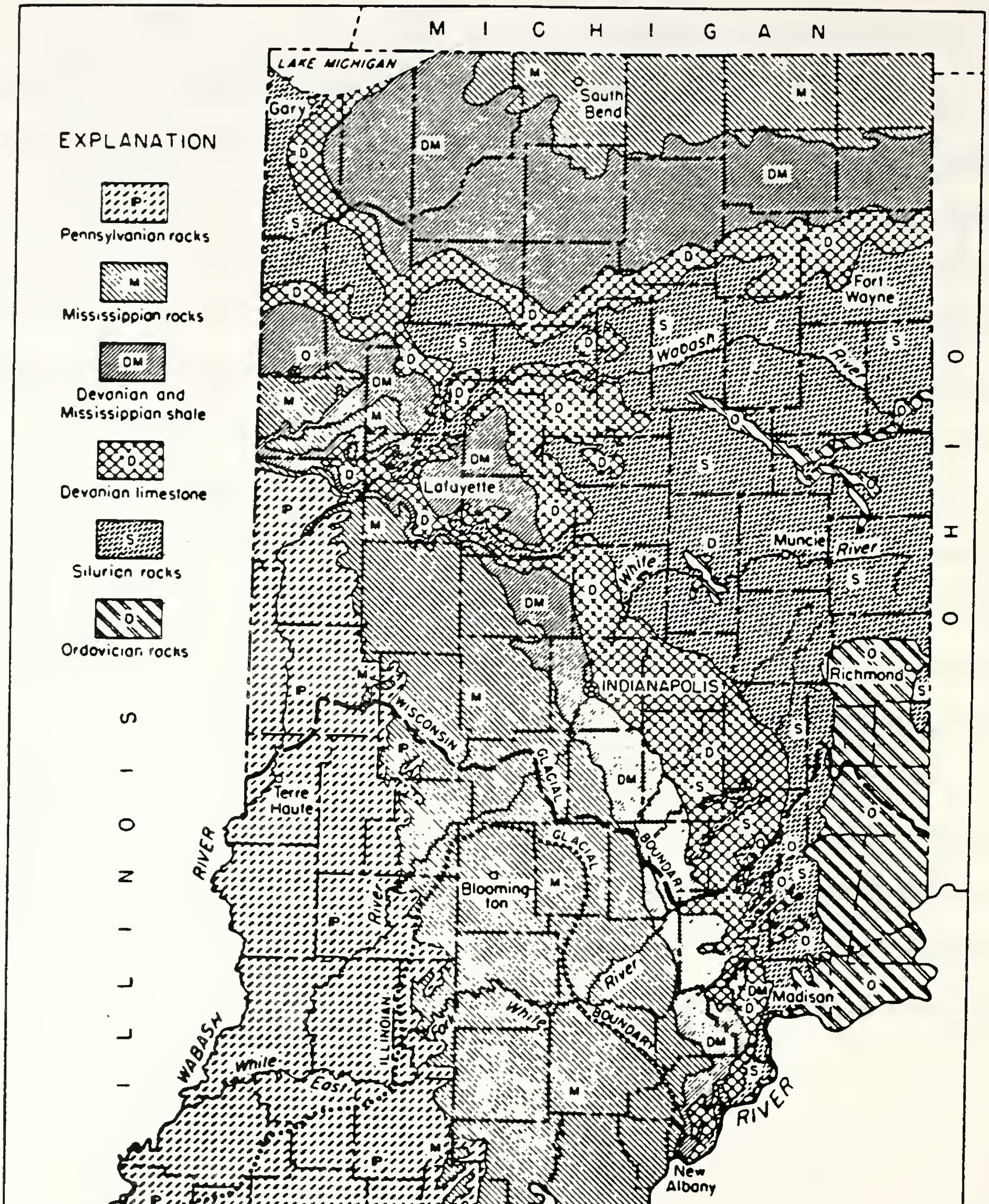


FIGURE 7. BEDROCK GEOLOGY OF INDIANA (21)

BEDROCK GEOLOGY

Jay County is underlain by rocks that are Ordovician to Silurian in age (Figure 8). Surface outcrops are seen only at a few places such as along deep stream channels and in stone quarries.

In the eastern part of Indiana, the uppermost Ordivician rocks consist of light- to dark-colored fine- to coarse-grained dolomitic limestone and fossiliferous limestone that are interbedded with argillaceous dolomite and calcareous shale. All the uppermost Ordovician rocks in eastern Indiana are generally assigned to the Richmond Group of the Cincinnatian Series (10).

Rocks of Ordovician age are encountered at depths ranging from about 500 to 750 feet in Jay County. Many wells have been drilled into these rocks in eastern Indiana to test the Trenton limestone for oil and gas (8). The Trenton limestone is usually overlain by several hundred feet of shale of Ordovician age, which are overlain by rocks of Silurian age except where the deepest parts of the pre-Pleistocene valleys may be cut into the uppermost rocks of Ordovician age.

Although an unconformity exists between rocks of Ordovician and Silurian ages, it commonly is difficult to recognize in drill cores.

The Brassfield Limestone, the lowermost rock unit of Silurian age, directly overlies the Ordovician rocks in northern and east-central Indiana. It consists of fine-grained dolomite and dolomitic limestone, and medium-grained fossiliferous limestone. Average thickness of the Brassfield Limestone in northern Indiana is about 12 feet, but in the northeast corner of Indiana the Brassfield equivalent, the Cataract Formation of Michigan, may be as much as 200 feet thick (10).

EXPLANATION

Silurian

Pleasant Mills Formation - Dolomite, Limestone, and Argillaceous Dolomite

Salamonie Dolomite, Cataract Formation, and Brassfield Limestone

Ordovician

Ordovician Rocks - Undifferentiated Shale and Limestone

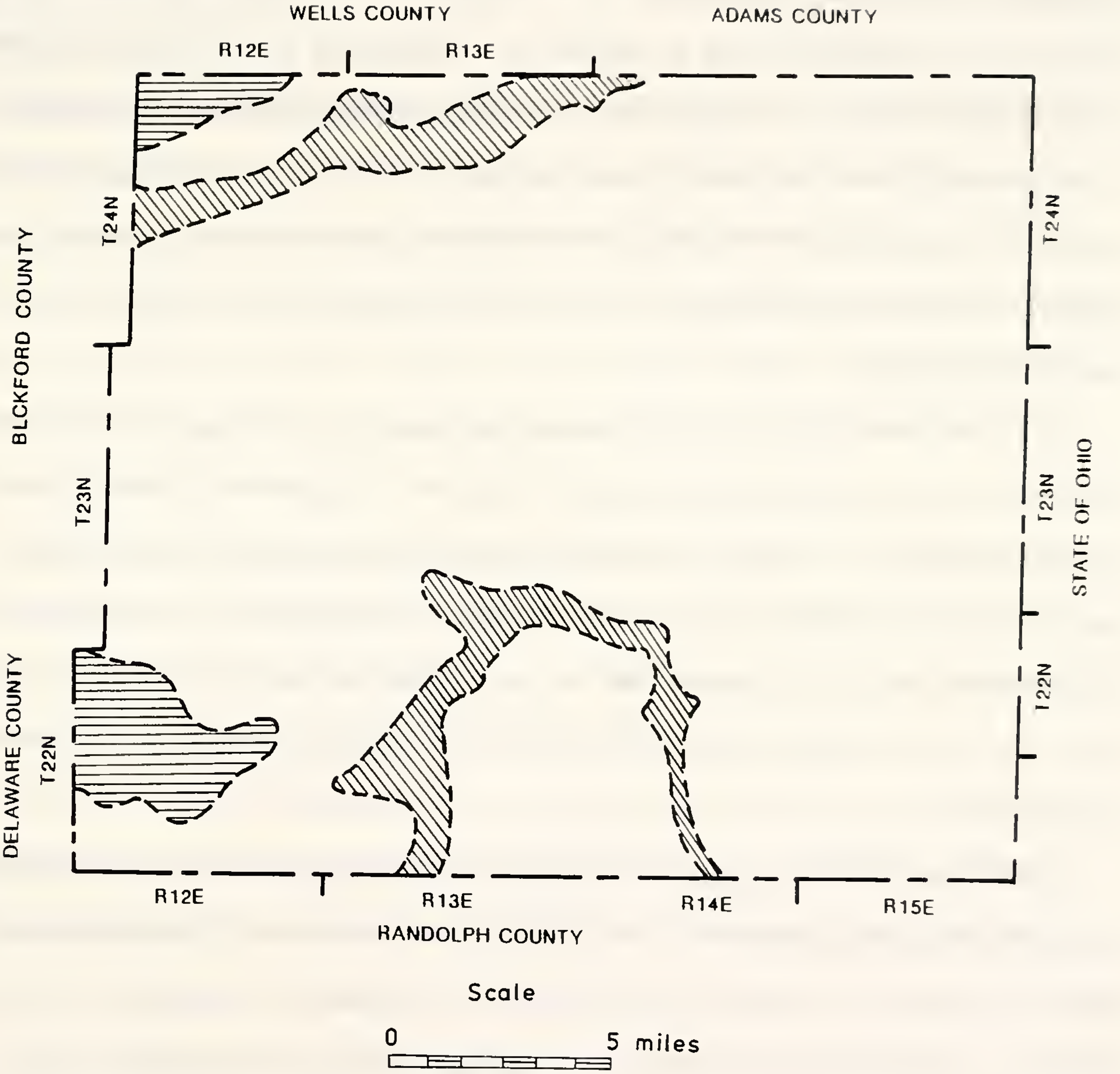


FIGURE 8. BEDROCK GEOLOGY OF JAY COUNTY (22)

The Salamonie Dolomite Formation, which overlies the Brassfield Limestone, is a thick deposit of carbonate rocks. Rocks referred to by earlier workers as the Huntington Dolomite and the New Corydon Limestone in east-central Indiana are now considered to be a part of the Salamonie Dolomite Formation (11). The Salamonie Dolomite was named for the occurrences of dolomite near the headwaters of the Salamonie River, in the vicinity of Portland, Jay County (10). The type locality for the exposures of the Salamonie Dolomite is in the Meshberger Brothers Stone Corporation quarry near Portland (10). In areas where exposures of the Salamonie Formation are seen in Jay and adjacent counties, it generally is a light-colored medium-grained porous dolomite that frequently has been called reef or reef-detrital dolomite.

In the northern one-third part of Indiana, the Salamonie Dolomite consits of two members that show considerable lateral extent. The lower member is light-gray and tan in color, and is a dense to fine-grained dolomitic limestone and argillaceous dolomite; chert is abundant and is the most characteristic mineral in the lower member. The upper member of the Salamonie Dolomite is light-gray to white in color, and is a granular porous dolomite which commonly has been referred to as a reef-type dolomite in subsurface studies done by earlier workers (11).

The Pleasant Mills Formation, which belongs to the Salina Group of Silurian age, overlies the Salamonie Dolomite Formation. This formation consists mainly of argillaceous dolomite, dolomitic limestone, and dolomite. The Pleasant Mills Formation is subdivided into three members, viz. the Limberlost Dolomite, the Waldron, and the Louisville members (10).

The lowermost member of the Pleasant Mills Formation is the Limberlost Dolomite. The Limberlost Dolomite was earlier referred to as the Limberlost Dolomite Formation (10, 12). It is a brown to tan colored, pure granular dolomite that has a variable thickness ranging from

zero to more than 70 feet (12). The middle member, now known as the Waldron Member but previously classified as the Waldron Formation, consists of shales that are typically interbedded with fossil-bearing limestones and silt. The uppermost member of the Pleasant Mills Formation is the Louisville Member which consists of fairly pure dolomites in northern Indiana (10).

The Wabash Formation overlies the Pleasant Hills Formation in northern Indiana. It consists mainly of limestone, dolomite and argillaceous dolomite. The Wabash Formation has been divided into two members, viz. the Mississinewa Shale Member and the Liston Creek Limestone Member. The Mississinewa Shale Member is composed of gray argillaceous silty dolomite and dolomitic limestone. The Liston Creek Limestone Member consists of light-gray and tan fossiliferous cherty limestone and dolomitic limestone, with nodular and bedded chert being a characteristic mineral of the member (10, 12).

A nearly level limestone upland, known as the Bluffton Plain, constitutes the bedrock surface in east-central Indiana and slopes gently to the north . The plain formed upon the thick sequence of Silurian limestones and dolomites of northern Indiana, and its slope corresponds closely to the regional dip on the northeast side of the Cincinnati Arch (7).

The general bedrock topography of Jay County is illustrated in Figure 9. Bedrock exhibits the highest elevation, greater than 950 feet above mean sea level, in the southeastern portion of the county and the lowest, approximately 450 feet, in the northwestern part of the county.

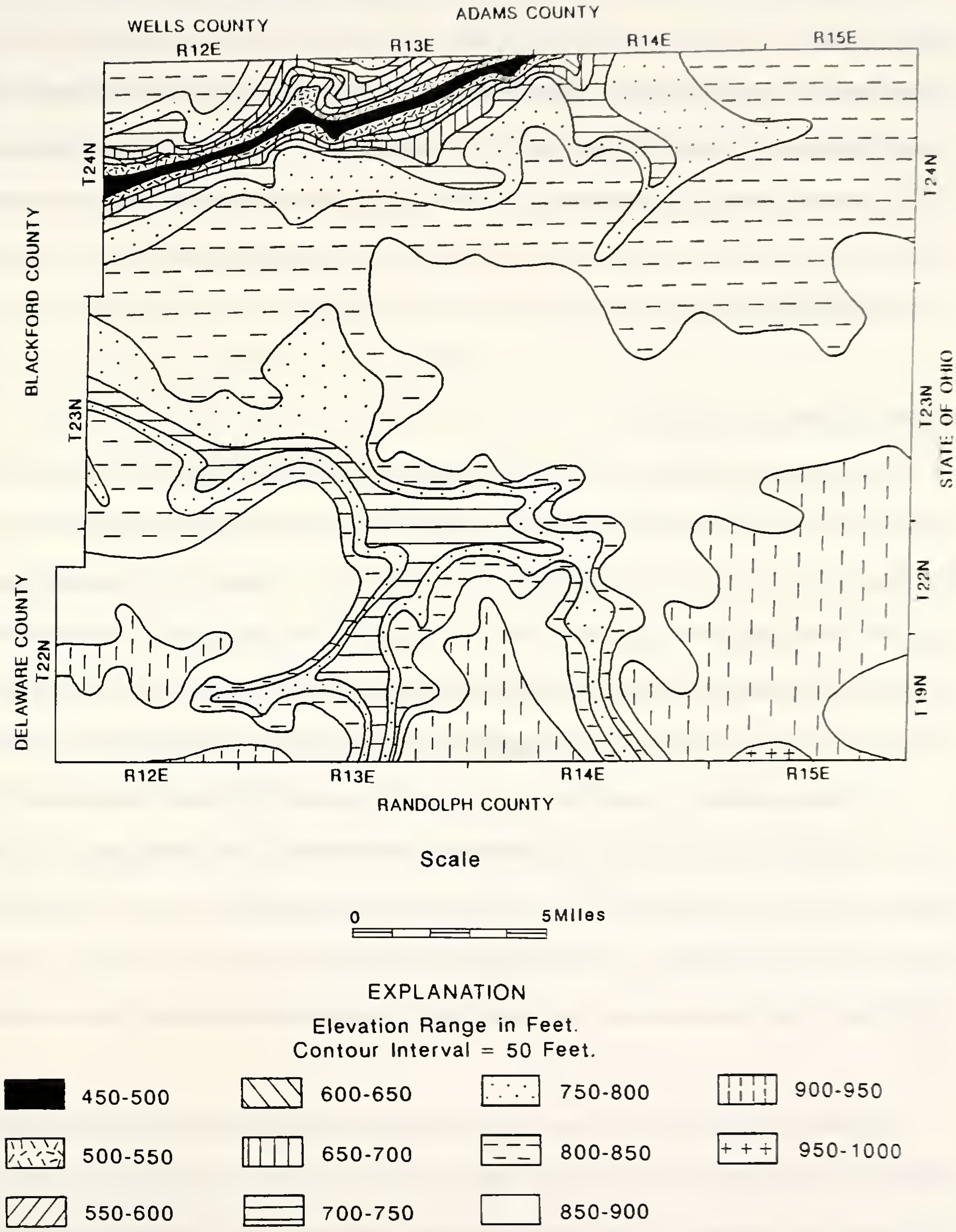


FIGURE 9. BEDROCK TOPOGRAPHY OF JAY COUNTY (23)

A pre-glacial stream system, known as the Teays Valley, was deeply entrenched in the Bluffton Plain. Part of this entrenched drainage system cuts across the northwestern portion of Jay County. Across the Bluffton Plain, the Teays Valley is completely filled by Quaternary glacial outwash and non-glacial alluvium (7). The deep Teays Valley probably formed because the massive dolomites and limestones found in the present-day valley walls were more resistant to erosion than the shales which presently occur beneath the glacial outwash material in the center of the Teays Valley.

PLEISTOCENE GEOLOGY

The youngest geologic materials in Jay County are the unconsolidated glacial deposits of Pleistocene age and alluvium of Recent age. The glacial deposits were formed by the ice sheets which moved over much of northern Indiana from Canada (7). These glaciers deposited large quantities of clay, silt, sand, and gravel over the bedrock surface of Jay County. At the present time, only those materials deposited by the youngest glacier of Wisconsinan age are recognized at the surface. Also, the present day topography is mainly a result of this continental glaciation.

The bedrock surface of Jay County is completely covered by Wisconsinan glacial drift, except along the Wabash River in the extreme northern part of the county, and along the Salamonie River near Portland (2, 8). The thickness of glacial drift is variable, ranging from a few feet to nearly 350 feet (2, 8, 9). However, depressions in the bedrock surface as a result of the Teays Valley may contain as much as 400 feet or more of unconsolidated glacial materials (7).

The level topography of Jay County is broken by two low ridge moraines: the Salamonie Moraine and the Mississinewa Moraine. The Salamonie Moraine crosses the central part of Jay County and trends in a northwest-southeast direction. The Mississinewa Moraine

traverses the southern part of the county, and is roughly parallel to the Salamonie Moraine (2).

The distribution of unconsolidated deposits of Jay County is shown in Figure 10, and the variable thickness of these unconsolidated deposits is illustrated in Figure 11. A schematic representation of the relationships between unconsolidated deposits in the county is presented in Figure 12.

As seen in Figure 10, the unconsolidated deposits of Wisconsinan age occur mainly in the form of ground and ridge moraines. These deposits are primarily composed of till, which is a poorly sorted mixture of silty clay with some sand and gravel. The Mississinewa and Salamonie ridge moraines are comprised largely of a clayey till; however, the drift material in the Mississinewa ridge moraine contains lesser amounts of boulders, gravel and sand than the Salamonie ridge moraine (2, 9).

Unconsolidated deposits of Late Wisconsinan and Recent age are composed primarily of clay, silt, sand, muck, and gravel. Basins of cumulose drift in the form of muck and peat exist in a few locations on the ground moraine and within the ridge moraines.

The deposits of Recent age that occur in Jay County consist of alluvium along the flood plains of the Salamonie River, Loblolly Creek, Limberlost Creek, Brooks Creek, and their tributaries.

EXPLANATION

Recent	Silt, Sand, and Gravel - Mostly Alluvium, Martinsville Formation
Recent and Wisconsinan	Muck, Peat, and Marl - Paludal and Lacustrian Deposits. Martinsville Formation
	Muck, Clay, Silt and Gravel - Alluvial, Colluvial, and Paludal Deposits
	Clay, Silt, and Sand - Clay-rich Lacustrian Facies of Atherton Formation
	Gravel, Sand, and Silt - Valley Train Deposits. Outwash Facies Atherton Formation
Wisconsinan	Gravel and Sand - Kame and Esker Deposits
	Till - Wisconsinan Ground Moraine
	Till - Wisconsinan End Moraine

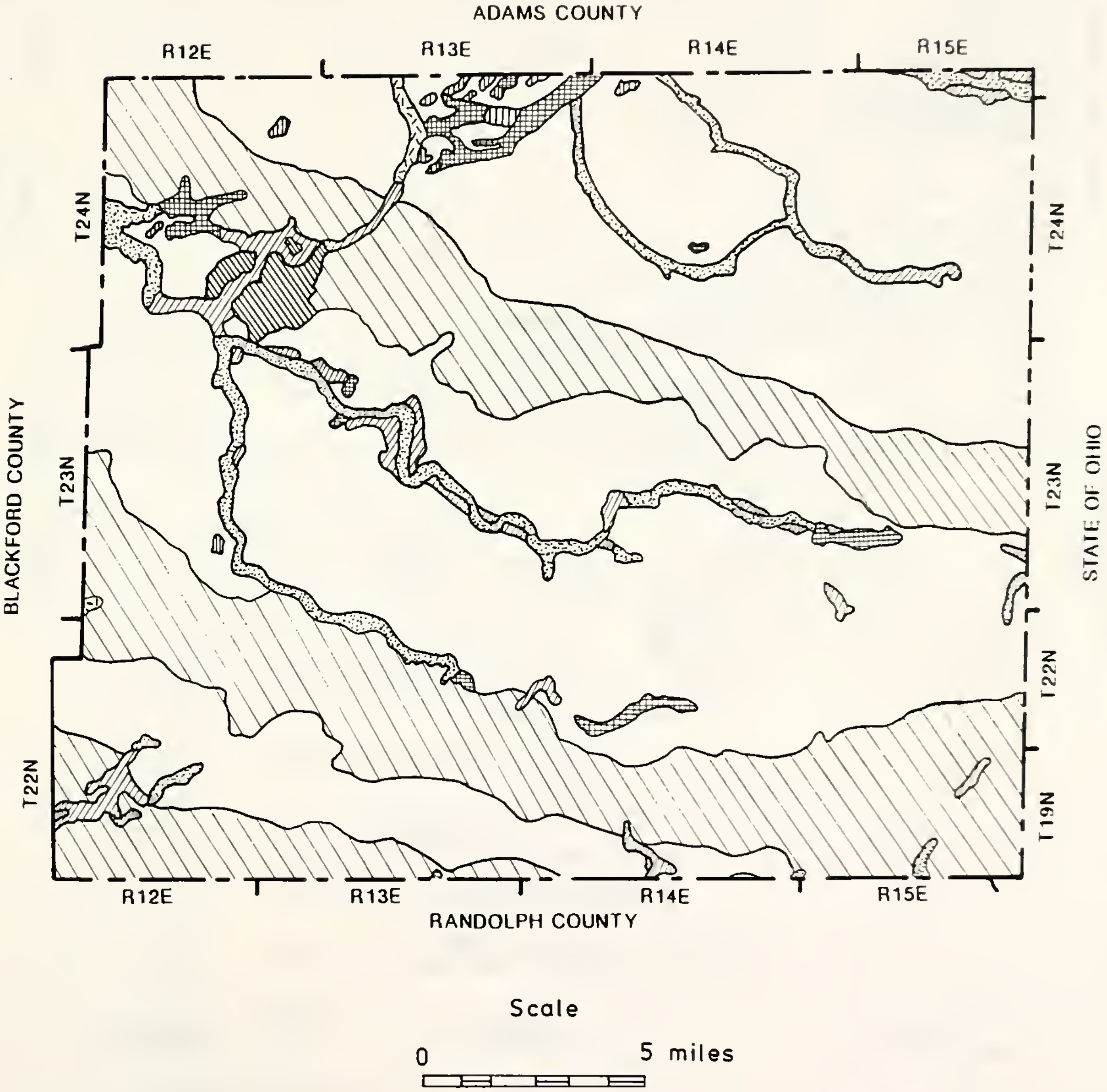


FIGURE 10. UNCONSOLIDATED DEPOSITS OF JAY COUNTY (24)

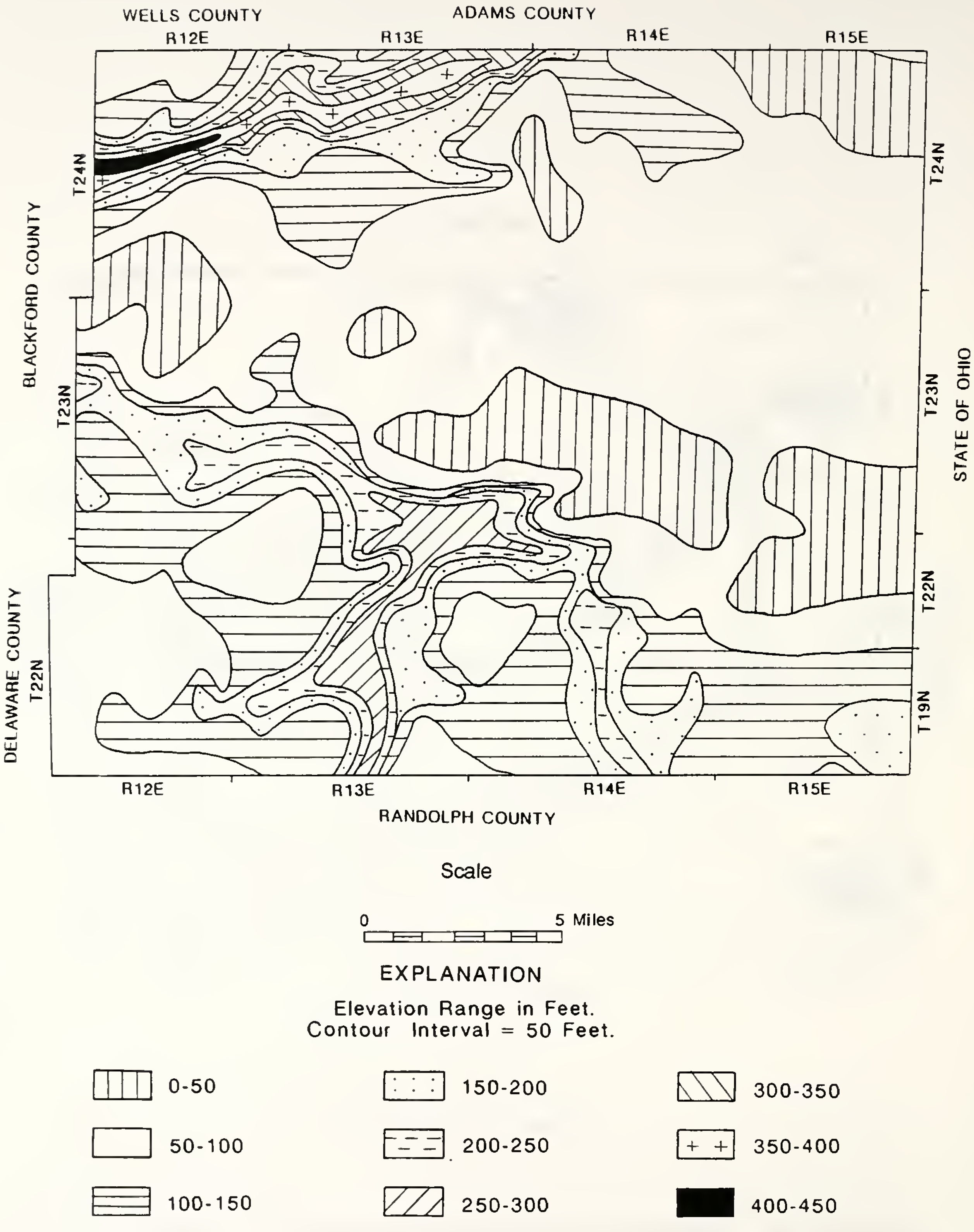
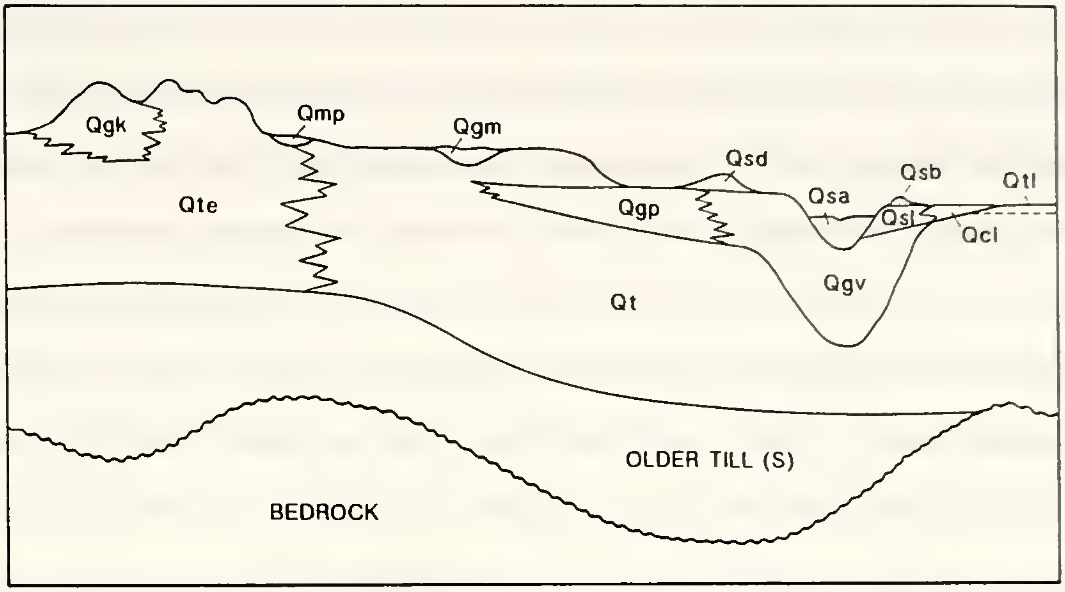


FIGURE 11. THICKNESS OF UNCONSOLIDATED DEPOSITS (25)



EXPLANATION

Quaternary	Qsa	Silt, sand, and gravel
	Qmp	Muck, peat, and marl
	Qgm	Muck, clay, silt, and gravel
	Qcl/Qsl	Clay, silt, and sand
	Qsd/Qsb	Sand
	Qgv/Qgp	Gravel, sand, and silt
	Qgk	Gravel and sand
	Qt/Qte	Till

FIGURE 12. SCHEMATIC SECTION SHOWING RELATIONSHIPS OF UNCONSOLIDATED DEPOSITS (25)

LANDFORM-PARENT MATERIAL REGIONS

The engineering soils in Jay County were derived primarily from unconsolidated materials. These materials have been classified according to parent material and landform in the following section. In all, five parent material units have been mapped in Jay County. These units are glacial drift, fluvial drift, lacustrine drift, cumulose drift, and mined land. The parent materials are further subdivided into individual landforms for discussion purposes.

Each of the different landform-parent material regions is characterized by its surface character, overall areal extent, and general soil profile. The soils in each of the regions have been classified using both the United States Department of Agriculture (USDA) textural designation, i.e. clay loam, and also the American Association of State Highway and Transportation Officials (AASHTO) system, i.e. A-6(10). Additionally, the agricultural soil series that occur in each of the different landform units have been indicated. The physical, chemical, and engineering index properties of the soils that are encountered in Jay County are listed in Appendices B and C. Boring numbers, which correlate to the classification test results presented in Appendix A, are given for each corresponding soil unit.

The engineering considerations for the landform-parent material regions are briefly addressed. The objective of this discussion is to provide a general idea of soil behavior and of the possible problems that may arise within a given landform-parent material region in Jay County. For site-specific information, the reader is referred to the information contained in Appendix A, and to the soil investigation reports listed in the references.

Glacial Drift

Glacial drift almost completely covers the bedrock of Jay County, except along the Wabash River in the northern part and along the Salamonie River near Portland (2,8). The

types of glacial landforms present in Jay County are the Wisconsinan ridge moraines and ground moraine.

Ridge Moraine

Two ridge moraines are present in Jay County. They are the Salamonie Moraine in the central part of the county, and the Mississinewa Moraine in the southern part of Jay County. These two ridge moraines are nearly parallel to each other and separated by a level plain of Wisconsinan ground moraine.

The Salamonie ridge moraine has an average width of approximately 2.5 miles in Jay County, and is bounded to the south by the Salamonie River. Groups of gravelly knolls are conspicuous at places along it (9). However, the greater part of the Salamonie ridge moraine exhibits a subdued swell and sag topography (9).

The Mississinewa ridge moraine has an average width of about 2.5 miles in Jay County. It is characterized by swell and sag topography which has few sharp knolls and only a few basins (2,9).

The ridge moraines exhibit a deranged dendritic regional drainage pattern that is poorly developed. Drainage is improved through the construction of artificial drainage systems, tiles or ditches. The gullies that develop on ridge moraines are commonly broad saucer shaped C-type with extremely long low gradients (13). The mottled light and dark photo tones associated with Wisconsinan ridge moraines indicate the presence of fine-grained materials. The parent material on ridge moraines is unsorted sand, clay, silt, gravel, and boulders. Layers of stratified sand and silty sand may also be seen within the unsorted material (13).

The soil profiles for the Wisconsinan ridge moraines in Jay County were divided into two categories. The categories are high and low areas on ridge moraines and represent the general

subsoil conditions of the areas of higher and lower elevation on the Wisconsinan ridge moraines.

The soils developed in the high areas of the ridge moraines in Jay County include the Glynwood, Morley, and Blount pedological series (1). These soil series are characterized by clay (A-6(10), A-6), sandy loam (A-4), and clay loam (A-6, A-4) from the surface to a depth of about twelve inches. Underlying the surface soil to a depth of about 48 inches or more are clay loam (A-4) and clay (A-6(10), A-6).

The dominant soils developed in the low areas of ridge moraine include the Pewamo, and the Wakill Variant. Isolated areas of the Houghton (organic) soil series are found in the deeper depressions on the ridge moraines. The Houghton soils are deposits of shallow water lacustrine sediments and organic matter and are discussed further under the category of Cumulose Drift. The surface soils of the low areas of the ridge moraines are characterized by organic silty clay and sandy clay loam (A-2-6) to a depth of 12 inches. These surface soils are underlain by clay loam (A-6, A-4), and clay (A-6(10)); silty loam and sandy loam may also occur at places.

Borehole numbers 32-38, 83, 84, and 94-151 are located on the ridge moraines in Jay County.

Ground Moraine

A large part of Jay County is covered by Wisconsinan ground moraine. The ground moraine has a gently undulating topography and is characterized by low swells and shallow swales.

The regional drainage pattern seen on ground moraines is broadly dendritic. The gullies developed on the ground moraines are usually of the C-type where clay and silty clay occur.

In areas where large amounts of gravel and sand occur, V-type gullies may develop (13).

A light-gray to white photo tone is displayed by the high areas on ground moraines and indicates the presence of silty soils. The low areas on ground moraines exhibit a black to dark-gray photo tone that indicates the presence of highly organic soils. The parent material of ground moraines is an assorted mixture of clay, silt, sand, and gravel, with a few boulders (13). In general, almost all the soils located on Wisconsinan ground moraines in Indiana can be classified as silty clays.

The surface soils developed on the ground moraine in Jay County generally consist of clay loam (A-4), sandy clay loam (A-2-6), clay (A-6), and sandy loam (A-4). Highly organic topsoils occurs in the depressions on the ground moraine. The subsurface soils, i.e. below a depth of 24 inches, usually consist of clay (A-6(10), A-6, A-7-6), silty clay loam (A-4), and clay loam (A-4). The agricultural soils developed on the ground moraine in Jay County belong to the Martinsville, Blount, and Glynwood pedological series.

Highly organic topsoil is found in depressions on both ground and ridge moraines throughout Jay County. This topsoil belongs to the Pewamo, Wakill Variant, and Houghton soil series. The organic content of these surface soils ranges from four to 70 percent or more. The soils which underlie the highly organic topsoil are variable and consist of silty clay loam (A-4), clay, and silty clay.

Borehole numbers 39-82, 85-93, and 159-226 are located in ground moraine.

Engineering Considerations in Glacial Drift

The soils in glacial drift areas of Jay County are moderately plastic with plasticity indices ranging from five to 43, and liquid limits ranging from 20 to 65. These soils are cohesive and range in consistency from soft to stiff. The permeability of the soils developed on the glacial

drift is low. Consequently, these areas are subject to slow runoff, ponding, and have a high potential for shrink-swell and frost action.

In areas of glacial drift, numerous road and highway problems can occur. The common problems that develop in the highly organic glacial drift areas are pavement pumping, frost heave, erosion of slopes, and poor drainage. Pavement pumping occurs when water carrying soil particles is forced out between pavement joints or cracks under normal traffic loads (14).

The bearing capacity of the soils developed on glacial drift ranges from low to fair. Slope failure can occur at places where water-saturated layers of permeable material are present. Glacial drift areas are also severely limited as sites for highways or streets due to their low strength, and high frost action and shrink-swell potential. These areas are limited as sites for septic tank fields due to the low permeability and poor drainage (15). Areas on the ground moraine where the thickness of glacial drift exceeds 30 feet are potential sites for engineered landfills with minimal damage to the environment. A detailed site investigation should be performed wherever a large or heavy structure is to be constructed on glacial drift.

FLUVIAL DRIFT

Fluvial drift occurs in two separate landforms in Jay County: along the flood plains of rivers and their tributaries, and on the terraces along the rivers.

Flood Plains

The largest flood plain areas in Jay County are along the rivers and their major tributaries: the Salamonie River, the Little Salamonie River, the Wabash River, Loblolly Creek, Brooks Creek, and Halfway Creek. The soils developed on flood plains in Jay County belong to the Eel, Eel Variant, Eldean, Saranac, and Wakill pedological soil series (1). The surface soils on flood plains consist of sandy loam (A-2-4), clay loam (A-6(14)), and clay (A-6) to a depth of

24 inches; in some areas, organic silty clay may occur at the surface. The surface soils are underlain by clay loam (A-4(3)), sandy loam (A-2-4), clay (A-6(12)), and gravelly sand (A-1-b(0)) to a depth of 40 inches or more. Limestone bedrock may be encountered at depths generally greater than 17 feet below the surface in flood plain areas.

Borehole numbers 1-31, 152-158, and 227-239 are located in flood plain areas.

River Terrace

Recent river terraces are found along the Salamonie River, the Little Salamonie River, the Wabash River, and their major tributaries. A large terrace is seen to occur east of the town of Pennville in the northwestern quarter of Jay County. Recently eroded sediments, and reworked outwash sand and gravels of the glacial epoch, provide the materials for river terraces. The river terraces are composed primarily of stratified deposits of silt, sand, and gravel with some clay. Soils belonging to the Martinsville, Eldean, and Whitaker pedological soil series typically occur on river terraces in Jay County (1). The surface soils on river terraces consist of clay loam, silty loam, and loam. Underlying these surface soils are gravelly sandy loam, and stratified sandy clay loam to a depth of 48 inches. At greater depths, stratified sand and gravel (A-1, A-2) and stratified silt loam to sand (A-2, A-4, A-6) are encountered.

There are no soil borings on river terraces.

Engineering Considerations in Fluvial Drift

The soils on flood plains are slightly to moderately plastic with plasticity indices ranging from four to 43, and liquid limits ranging from 20 to 69.

The soils developed in flood plain areas are highly variable over distance and depth, and can range from loose sands to weak compressible clays. This variability of the soils can lead

to foundation problems as a result of non-uniform strength. Flood plains are severely limited as sites for roads or highways due to their low strength soils, high shrink-swell potential, frost action, and seasonal flooding (15).

The groundwater table in flood plain areas is high and ponding and surface flooding are frequent. Because of the flooding and general wetness, flood plain areas are poorly suited for dwellings and for septic tank fields (15).

The river terrace soils in Jay County are incohesive and non-plastic with plasticity indices ranging from two to 15, and liquid limits ranging from 15 to 40. The soils in these areas generally have a moderately high permeability and a high porosity. The water table in the terrace areas is high; consequently, low areas on terraces are subject to flooding. The bearing capacity of the terrace soils ranges from fair to good. Also, the deposits in terraces can be used as a commerical source of sand and gravel (13).

For terrace areas with high silt content, frost action and shrink-swell potential are high (15). This limits the terrace soils as potential sites for roads and streets. Slope failure in cuts made in terraces is also possible due to water seepage.

The moderately high permeability of the terrace soils makes them impractical as sites for landfills or septic tanks since the rapid drainage can lead to groundwater contamination (1).

LACUSTRINE DRIFT

Lacustrine Plains

A number of lacustrine plains are widely scattered in Jay County. These lacustrine plains lack beach ridges, which distinguishes them from true lake plains, and are generally a few acres in size. In general, lacustrine drift consists of fine-grained materials.

The pedological soils that develop on lacustrine plains in Jay County are the Bono and Bono Variant soil series (1). The surface soils of the lacustrine plains are characterized by

organic silty clay, loam, and muck. The organic content of these surface soils ranges from four to 31 percent. At depths greater than 10 inches, the lacustrine plain soils consist mainly of silty clay and silty clay loam (A-7) that may occasionally have thin seams of sand.

Engineering Considerations in Lacustrine Drift

The lacustrine deposits are moderately plastic with plasticity indices ranging from 20 to 44, and liquid limits varying between 40 and 65.

These lacustrine deposits have a low permeability and are subject to flooding or ponding due to a high water table and poor drainage. As a result, these soils have a high potential for frost damage (15).

Lacustrine soils exhibit poor to fair compaction characteristics. These soils have low strengths and a high shrink-swell potential which reduces their bearing capacity. The presence of thin seams of sand, which act as planes of weakness, can commonly lead to failure of cut slopes built in lacustrine soils. Roads constructed on lacustrine soils should be built on raised, well-compacted fill material with side ditches and culverts to improve roadside drainage (14). Additionally, the roads should be placed on quality base material to increase their load-bearing capacity and to decrease their susceptibility to frost damage (1). The low permeability and high water table makes the lacustrine soils commonly unsuitable as sites for septic tanks and tile fields (1).

CUMULOSE DRIFT

Muck Basin

Deposits of muck and peat occur in Jay County in kettle-like depressions on ground and ridge moraines, flood plains, and lacustrine plains. Most of the muck basins mapped in Jay County have limited areal extent. However, a large muck basin is seen to occur north of the

town of Poling near the northern border of Jay County. These muck basins usually exhibit a dark photo tone, and are characterized by flat topography and the absence of natural drainage (13).

The major soil series found in muck deposits in Jay County is the Houghton pedological soil series (1). This soil series is characterized by a highly organic silty clay from the surface down to a depth of 50 inches. The organic content of the Houghton soils can be as high as 70 percent. Other surface soils that can develop in muck basins include clay, silty loam, and silty clay loam. Underlying these surface soils are silt, sandy clay loam, and gravelly sandy loam.

Engineering Considerations in Cumulose Drift

The soils that develop in cumulose drift have a very high organic content, and are characterized by low densities and a high natural water content. The permeability and porosity of these soils in Jay County is high. These soils have a soft to very soft consistency and are compressible. The low shear strength, coupled with high compressibility, makes cumulose drift unsuitable for fill or foundation material. Cumulose drift areas are also unsuitable as sites for roads and streets. In general, areas of cumulose drift are avoided during construction as they require special foundations and special fills. However, if this is not possible, removal of the cumulose drift may be needed. Preloading can also be used to improve the bearing capacity of these soils.

Although these soils have low to moderately high permeability, they generallly possess a high water table and are susceptible to flooding and frost action (1). The cumulose drift occurring in Jay County is unsuitable as sites for septic tank fields or sanitary landfills (15). Knowledge of the location of muck deposits is important due to the high compressibility and low strength of organic matter.

Because of frequent ponding, muck basins may qualify as potential wetlands which are protected under Federal laws that limit any major construction activity in these areas.

MINED LAND

Gravel Pits

Several gravel pits are located in Jay County, especially near the town of Pennville, and along the Salamonie River.

Gravel pits are generally found on outwash plains or terraces of major streams. The gravel pits are open excavations from which sand and gravel have been removed for construction material. Most of the gravel pits are shallow, although some may reach 30 feet in depth. The abandoned pits are generally filled with water and may be considered as wetlands under Federal law. Since these areas are highly variable and disturbed, a detailed site investigation is needed if these areas are to be used as sites for roads, buildings, and septic tank absorption fields (1).

SUMMARY OF ENGINEERING CONSIDERATIONS IN JAY COUNTY

Table 5 contains a summary of engineering considerations for different landform-parent material regions in Jay County. Each of the landform-parent material regions discussed in the earlier section is represented in the table, along with the probability of certain problems that may be encountered. The rankings, as shown in Table 5, represent the average behavior and characteristics of the parent material type, and should therefore be used only as general guidelines when planning any construction projects in Jay County.

Table 5: Summary of Engineering Considerations for Landform-Parent Material Regions in Jay County

EXPLANATION

PROBABILITY OF A MAJOR PROBLEM DEVELOPING
L (LOW)
M (MEDIUM)
H (HIGH)

AVAILABILITY RATING
1 (LOW)
2 (MEDIUM)
3 (HIGH)

		CUT DESIGN					EMBANKMENT FILLS					EMBANKMENT FOUNDATION				SUBGRADE				FOUNDATION DESIGN								MISCELLANEOUS				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
							COMPACTED PROPERTIES													SHALLOW FOOTINGS			PILES									
LANDFORM	GENERAL SOIL TEXTURE	SOIL/ROCK BACKSLOPE INSTABILITY	GROUNDWATER CONTROL	EROSION POTENTIAL	SURFACE DRAINAGE	NATURAL SLOPE AND RIVER BANK INSTABILITY	EROSION RESISTANCE	RELATIVE PERMEABILITY	INADEQUATE SHEAR STRENGTH	COMPRESSIBILITY WHEN SATURATED	WORKABILITY PROBLEMS	INADEQUATE SHEAR STRENGTH	EXCESSIVE SETTLEMENTS	ORGANIC DEPOSIT OCCURRENCE	GROUNDWATER CONTROL	SUBGRADE SUPPORT INADEQUATE	FROST ACTION POTENTIAL	PUMPING POTENTIAL	SHRINK-SWELL POTENTIAL	INADEQUATE BEARING CAPACITY	EXCESSIVE SETTLEMENT POTENTIAL	SCOUR POTENTIAL	INADEQUATE BEARING CAPACITY	EXCESSIVE SETTLEMENT POTENTIAL	NEGATIVE SKIN POTENTIAL	SCOUR POTENTIAL	ESTIMATION OF LATERAL EARTH PRESSURES FOR RETAINING STRUCTURES	AVAILABILITY OF AGGREGATE	STEEL CORROSIVITY	CONCRETE CORROSIVITY	BEHAVIOR OF SEPTIC TANK FIELDS	GROUNDWATER RESOURCE POTENTIAL
RIDGE MORAINE	SAND, SILT, CLAY	L	L/M	L/M	M	L	M	1	L/M	M	L	L	L	M/H	L/M	L/M	M	L/M	L/M	L	L	L	L	L	L/M	L/M	M	1	M	L	H	1
GROUND MORAINE	SAND, SILT, CLAY	L	L/M	L/M	M	L	M	1	L/M	M	L	L	L	M/H	L/M	L/M	M	M/H	L/M	M	L	L	L	L	L/M	L/M	M	1	M	L	H	1
LACUSTRINE PLAIN	CLAY, SILT	L	H	L/M	M/H	L	L	1	M/H	M/H	H	H	H	H	H	M/H	H	H	H	M/H	H	L/M	M/H	H	M/H	L/M	M	1	M	H	M/H	1
FLOOD PLAIN	CLAY, SILT, SAND	M	M	H	M/H	M	L/M	1,3	M	M	M	H	L/M	M	M	M	M	M	M	L/M	L/M	M	L/M	L/M	M	M/H	M	1,2	L	M	M/H	2
RIVER TERRACE	CLAY, SILT, SAND, GRAVEL	L	L/M	M	L	L/M	L	2,3	L	L	L	L/M	L	L/M	L/M	L	L/M	L/M	M/H	L	L	L	L	L	L	L	L	2,3	L	L	L/M	2
ORGANIC DEPOSITS	MUCK, MARL	M	H	H	H	L	L	1,2	H	H	H	H	H	H	H	H	H	H	H	H	H	H	M/H	H	H	H	H	1	H	H	H	1

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APPENDIX A

CLASSIFICATION TEST RESULTS FOR SELECTED ENGINEERING PROJECTS IN JAY COUNTY

APPENDIX A. CLASSIFICATION TEST RESULTS FOR SELECTED ENGINEERING PROJECTS IN JAY COUNTY (25 - 42)

Boring No.	Project	Sample No.	Station No.	Offset Ft.	Ground Elevation Ft.	Sample Depth Ft.	Soil Description: Texture	Soil Description: AASHTO	Blow per Ft.	Grain Size Distribution: Gravel	Sand	Silt	Clay	LL	PL	PI
1	S.R. 1 over	1	49 + 78	40 LT	867.7	0.0 - 2.5	Silty loam		11							
	Little Beaver	2	"	"	"	2.5 - 5.0	Silty Clay Loam	A-7-6(16)	17	6.5	18.5	50.1	24.9	46.8	26.0	20.8
	Creek	3	"	"	"	5.0 - 7.5	Clay	A-6(12)	34	3.0	17.2	48.9	30.9	36.4	20.2	16.2
	"	4	"	"	"	7.5 - 10.0	Till	A-1-b(0)	33							
	"	5	"	"	"	10.0 - 15.0	Sandy Gravel	"	31							
	"	6	"	"	"	15.0 - 20.0	"	"	32	49.0	36.0	13.1	1.9	20.3	15.7	4.6
	"	7	"	"	"	20.0 - 25.0	"	"	21							
2	"	1	50 + 24	35 RT	863.9	0.0 - 2.5	Loam		11							
	"	2	"	"	"	3.5 - 5.0	Clay	A-6	20							
	"	3	"	"	"	6.0 - 8.5	Sandy Gravel	A-1-b	30							
	"	4	"	"	"	8.5 - 10.0	Gravelly sand w/Interbeded Gravel	A-1-b(0)	23							
	"	5	"	"	"	13.5 - 15.0	"		32							
	"	6	"	"	"	17.5 - 20.0	"		33							
	"	7	"	"	"	23.5 - 25.0	"		22	37.0	50.0	10.9	2.1	-	-	-
3	"	1	52 + 30	30 RT	868.8	0.0 - 2.5	Sandy loam		22							
	"	2	"	"	"	2.5 - 5.0	Clay	A-6	13							
	"	3	"	"	"	5.0 - 7.5	"	A-7-6(24)	16	0.1	11.7	45.3	42.9	47.6	22.4	25.2
4	S.R. 18 over	1	1064 + 65	17 L	846.7	0.0 - 2.5	Sandy loam		22							
	Bear Creek	2	"	"	"	2.5 - 5.0	Silty clay loam		9							
	"	3	"	"	"	5.0 - 7.5	"		12							
	"	4	"	"	"	7.5 - 10.0	Silty clay		22							
	"	5	"	"	"	10.0 - 12.5	"		15							
	"	6	"	"	"	12.5 - 15.0	Sand		14							
	"	7	"	"	"	18.0 - 22.5	Clay loam w/gravel		18							
	"	8	"	"	"	22.5 - 27.5	"		15							
	"	9	"	"	"	27.5 - 30.0	"		20							

APPENDIX A. (CONTINUED)

Boring No.	Project	Sample No.	Station No.	Offset Ft.	Ground Elevation Ft.	Sample Depth Ft.	Soil Description		Blow per Ft.	Grain Size Distribution				LL	PL	PI
							Texture	AASHTO		Gravel	Sand	Silt	Clay			
5	S.R. 18 over Bear Creek	1	1065 + 98	24 L	845.3	0.0 - 2.5	Clay loam		5							
		2	"	"	"	2.5 - 5.0	"		17							
	"	3	"	"	"	5.0 - 7.5	Clay loam w/gravel		21							
	"	4	"	"	"	7.5 - 10.0	"		22							
	"	5	"	"	"	10.0 - 15.0	"		36							
	"	6	"	"	"	15.0 - 17.5	"		20							
	"	7	"	"	"	17.5 - 22.5	Silty clay loam		16							
	"	8	"	"	"	22.5 - 27.5	Clay loam		14							
	"	9	"	"	"	27.5 - 32.5	Silty clay loam w/gravel		17							
	"	10	"	"	"	32.5 - 37.5	Silty clay w/gravel		15							
	"	11	"	"	"	37.5 - 42.5	"		28							
	"	12	"	"	"	42.5 - 47.5	Sandy loam		53							
	"	13	"	"	"	47.5 - 50.0	Sand & Gravel		132							
6	C.R. 54 over Salamonie River	1	9 + 11	10 L	868.1	0.0 - 2.0	Sandy loam		9							
		2	"	"	"	2.0 - 3.0	"		6							
		3	"	"	"	4.0 - 5.0	"		11							
	"	4	"	"	"	6.0 - 7.5	"		15							
	"	5	"	"	"	9.0 - 10.0	Sand & Gravel	A-1-b	9							
	"	6	"	"	"	13.5 - 15.0	"	"	20							
	"	7	"	"	"	18.5 - 20.0	Clay	A-6	27							
	"	8	"	"	"	23.0 - 25.0	"	"	26							
	"	9	"	"	"	28.5 - 30.0	Sand	A-2-4(0)	26							
	"	10	"	"	"	33.5 - 35.0	"	"	37	3.9	80.4	15.7	15.7			
7	"	1	10 + 03	5 R		0.0 - 1.5	Sandy loam		1							
	"	2	"	"		1.5 - 2.5	"	A-1-b	7							
	"	3	"	"		4.0 - 5.0	Sand & gravel	A-6	12							
	"	4	"	"		6.0 - 7.5	Clay	-	30							
	"	5	"	"		8.5 - 10.0	Silty loam	A-6	36							
	"	6	"	"		13.5 - 15.0	Sand	A-1-b	31							
	"	7	"	"		19.0 - 20.0	"	"	44							
	"	8	"	"		23.5 - 25.0	"	"	28							
	"	9	"	"		28.5 - 30.0	"	"	50							
	"	10	"	"		33.5 - 35.0	Sand & Gravel	A-1-b(0)	45							
	"	11	"	"		38.5 - 40.0	"	"	65	45.2	6.9	6.9	6.9			
	"	12	"	"		43.5 - 45.0	"	"	60							
	"	13	"	"		48.5 - 50.0	Sandy clay loam	A-6	60							

APPENDIX A. (CONTINUED)

Boring No.	Project	Sample No.	Station No.	Offset Ft.	Ground Elevation Ft.	Sample Depth Ft.	Soil Description Texture	Soil Description AASHTO	Blow per Ft.	RQD %	Grain Size Distribution Gravel	Sand	Silt	Clay	LL	PL	PI
8	C.R. 54 over	1	10 + 87	10 L	867.0	0.0 - 1.5	Sandy loam & gravel		5								
	Salamonie	2	"	"	"	1.5 - 3.0	Sandy clay loam		10								
	River	3	"	"	"	3.5 - 5.0	"	A-6(4)	14		3.4	47.7	26.0	22.9	31	17	14
	"	4	"	"	"	6.0 - 7.5	"	"	10								
	"	5	"	"	"	8.5 - 10.0	"	"	15								
	"	6	"	"	"	13.5 - 15.0	Clay	A-6	36								
	"	7	"	"	"	17.5 - 20.0	"	A-6(12)	26								
	"	8	"	"	"	23.5 - 25.0	"	"	22		4.6	12.7	44.3	30.3	35	20	15
	"	9	"	"	"	27.5 - 30.0	Sand	A-2-4	33								
9	C.R. 185 E.	1	9 + 49	13 R	920.2	1.0 - 2.5	Clay loam	A-4	10								
	over Salamonie	2	"	"	"	3.5 - 5.0	"	"	14								
	River	3	"	"	"	6.0 - 7.5	Silty Clay	A-6(17)	24		0	8	58	34	38	20	18
	"	4	"	"	"	8.5 - 10.0	"	"	15								
	"	5	"	"	"	13.5 - 15.0	"	"	4								
	"	6	"	"	"	18.5 - 20.0	Sandy loam	"	17								
	"	7	"	"	"	23.5 - 25.0	Clay	A-6	24								
	"	8	"	"	"	28.5 - 30.0	Gravelly Sand	A-1-b(0)	46		29	64	7	7			
	"	9	"	"	"	33.5 - 35.0	"	A-1-b	8								
	"	10	"	"	"	38.5 - 39.0	Clay	A-6	-								
10	"	1	9 + 98	7 L	921.0	11.5 - 13.0	Clay	A-6	2								
	"	2	"	"	"	14.0 - 15.5	"	"	3								
	"	3	"	"	"	16.5 - 18.0	"	"	14								
	"	4	"	"	"	19.5 - 20.5	"	"	21								
	"	5	"	"	"	24.5 - 25.5	"	"	11								
	"	6	"	"	"	29.0 - 30.5	Gravelly Sand	A-1-b	22								
	"	7	"	"	"	34.5 - 35.5	"	"	14								
	"	8	"	"	"	38.5 - 39.0	"	"	-								
	"	9	"	"	"	39.0 - 44.0	Limestone			0							
11	"	1	10 + 24	5 R	921.0	16.5 - 18.0	Clay	A-6	23								
	"	2	"	"	"	19.0 - 20.5	"	"	21								
	"	3	"	"	"	21.0 - 23.0	Gravully Sand	A-1-b	24								
	"	4	"	"	"	24.0 - 25.0	"	"	19								
	"	5	"	"	"	29.0 - 30.5	"	"	27								
	"	6	"	"	"	34.0 - 35.5	"	"	44								
	"	7	"	"	"	38.0 - 39.0	"	"	-								
	"	8	"	"	"	41.0 - 44.0	Limestone			0							
	"	9	"	"	"	45.0 - 47.0	"			0							

APPENDIX A. (CONTINUED)

Boring No.	Project	Sample No.	Station No.	Offset Ft.	Ground Elevation Ft.	Sample Depth Ft.	Soil Description		Blow per Ft.	RQD %	Grain Size Distribution				LL	PL	PI
							Texture	AASHTO			Gravel	Sand	Silt	Clay			
12	C.R. 185 E.	1	10 + 71	11 L	920.5	1.0 - 3.5	Silty Clay	A-6	8								
	over Salamonie	2	"	"	"	4.5 - 5.0	"	"	17								
	River	3	"	"	"	6.0 - 7.5	"	"	7								
	"	4	"	"	"	8.5 - 10.0	Clay loam	A-4(3)	5								
	"	5	"	"	"	13.5 - 15.0	Clay	A-6(11)	8								
	"	6	"	"	"	18.5 - 20.0	"	"	25		0	19	49	32	32	16	16
	"	7	"	"	"	23.5 - 25.0	Sandy Gravel	A-1-a(0)	15		63	36	1	1			
	"	8	"	"	"	28.5 - 30.0	"	"	22								
	"	9	"	"	"	33.5 - 35.0	"	"	38								
	"	10	"	"	"	38.5 - 38.6	"	"	-								
13	"	1	11 + 50	20 R	915.0	1.0 - 2.5	Silty clay	A-6	6								
	"	2	"	"	"	3.5 - 5.0	"	"	11								
	"	3	"	"	"	6.0 - 7.5	Clay Loam	A-4(3)	10		0	31	47	22	25	17	8
14	"	1	8 + 50	20 R	915.0	1.0 - 2.5	Silty clay	A-6	7								
	"	2	"	"	"	3.5 - 5.0	"	"	12								
	"	3	"	"	"	6.0 - 7.5	Clay loam	A-4	7								
	"	4	"	"	"	8.5 - 10.0	"	"	4								
	"	5	"	"	"	11.0 - 12.5	Gravelly Sand	A-1-b	12								
	"	6	"	"	"	13.5 - 15.0	Clay	A-6	18								
15	S.R. 67 over	1	130 + 54	43 L	841.9	1.0 - 2.5	Silty Clay loam	A-4	3								
	Montgomery	2	"	"	"	3.5 - 5.0	Sand	A-2-4(0)	14		0	85.0	15.0	15.0	NP	NP	NP
	Ross Ditch	3	"	"	"	6.0 - 7.5	"	"	12								
	"	4	"	"	"	8.5 - 10.0	Silty clay loam	A-4(4)	12		4.4	22.4	51.1	22.1	23.2	14.7	8.5
16	"	1	130 + 14	42 R	842.5	1.0 - 2.5	Silty clay loam	A-4	4								
	"	2	"	"	"	3.5 - 5.0	Gravelly sand	A-1-b(0)	22		32.9	56.4	10.7	10.7	NP	NP	NP
	"	3	"	"	"	6.0 - 7.5	"	"	14								
	"	4	"	"	"	8.5 - 10.0	Silty clay loam	A-4	12								
17	C.R. 215 E	1	15 + 65	9 L	847.8	1.0 - 2.5	Gravel	-	16								
	over Wabash	2	"	"	"	3.5 - 5.0	Clay	A-6(11)	14		0	15	49	36	35	22	13
	River	3	"	"	"	6.0 - 7.5	"	"	11								
	"	4	"	"	"	8.5 - 10.0	"	"	29								
	"	5	"	"	"	17.0 - 22.0	Limestone & Dolomite	-	-	0							

APPENDIX A. (CONTINUED)

Boring No.	Project	Sample No.	Station No.	Offset Ft.	Ground Elevation Ft.	Sample Depth Ft.	Soil Description		Blow per Ft.	RQD %	Grain Size Distribution				LL	PL	PI
							Texture	AASHTO			Gravel	Sand	Silt	Clay			
18	C.R. 215 E	1	16 + 15	8 R	848.2	13.5 - 15.0	Silty Clay	A-6	4								
	over Wabash	2	"	"	"	17.0 - 22.0	Limestone &	-	-	0							
	River						Dolomite										
19	"	1	16 + 70	6 L	848.5	13.5 - 15.0	Silty clay	A-6(9)	4		0	20	51	29	35	23	12
20	"	1	17 + 20	10 R	848.3	1.0 - 2.5	Limestone(fill)	-	19								
	"	2	"	"	"	3.5 - 5.0	Clay	A-6	18								
	"	3	"	"	"	6.0 - 7.5	"	"	10								
	"	4	"	"	"	8.5 - 10.0	"	"	8								
	"	5	"	"	"	13.5 - 15.0	Clay loam	A-6(7)	10		0	33	38	29	29	15	14
	"	6	"	"	"	17.0 - 21.5	Limestone &	-	-	0							
							Dolomite										
21	C.R. 87 over	1	10 + 00	14 L	885.0	1.0 - 2.5	Silty clay	A-7-6	12								
	Salamonie	2	"	"	"	3.5 - 5.0	Gravelly sand	A-1-b	11								
	River	3	"	"	"	6.0 - 7.5	Silty Clay	A-7-6	26								
	"	4	"	"	"	8.5 - 10.0	"	"	27								
	"	5	"	"	"	13.5 - 15.0	"	"	60								
	"	6	"	"	"	17.5 - 20.0	Gravelly Sand	A-1-b	28								
	"	7	"	"	"	23.5 - 25.0	Sand	A-3	28								
	"	8	"	"	"	27.5 - 30.0	"	"	28								
22	"	1	10 + 57	14 R	870.0	1.0 - 2.5	Loam	A-4	6								
	"	2	"	"	"	3.5 - 5.0	"	"	9								
	"	3	"	"	"	6.0 - 7.5	Gravelly sand	A-1-b	18								
	"	4	"	"	"	8.5 - 10.0	"	"	14								
	"	5	"	"	"	13.0 - 15.0	Silty clay loam	A-4(5)	25								
	"	6	"	"	"	18.5 - 20.0	"	"	23		5	12	59	24	25	16	9
	"	7	"	"	"	23.5 - 25.0	"	"	24								
	"	8	"	"	"	27.5 - 30.0	Gravelly sand	A-1-b	40								
	"	9	"	"	"	33.5 - 35.0	Silty clay loam	A-4	-								
	"	10	"	"	"	37.5 - 40.0	"	"	50								
	"	11	"	"	"	43.5 - 45.0	"	"	60								
	"	12	"	"	"	47.5 - 50.0	"	"	78								

APPENDIX A. (CONTINUED)

Boring No.	Project	Sample No.	Station No.	Offset Ft.	Ground Elevation Ft.	Sample Depth Ft.	Soil Description: Texture	Soil Description: AASHTO	Blow per Ft.	RQD %	Grain Size Distribution: Gravel	Grain Size Distribution: Sand	Grain Size Distribution: Silt	Grain Size Distribution: Clay	LL	PL	PI
23	C.R. 87 over	1	11 + 25	14 L	871.2	1.0 - 2.5	Loam	A-4-(2)	3		0	44	40	16	27	20	7
	Salamonie	2	"	"	"	3.5 - 5.0	"	"	3								
	River	3			" "	6.0 - 7.5	Silty clay	A-4	15								
	"	4	"	"	"	8.5 - 10.0	Sand	A-3	24								
	"	5	"	"	"	13.5 - 15.0	Silty clay loam	A-4	-								
	"	6	"	"	"	18.5 - 20.0	"	"	100								
	"	7	"	"	"	23.5 - 25.0	Sand	A-3(0)	39		5	86	9	9	NP	NP	NP
	"	8	"	"	"	27.5 - 30.0	"	"	37								
24	"	1	11 + 72	12 R	885.0	1.0 - 2.5	Silty clay	A-7-6	25								
	"	2	"	"	"	3.5 - 5.0	"	"	17								
	"	3	"	"	"	6.0 - 7.5	"	"	24								
	"	4	"	"	"	8.5 - 10.0	"	"	35								
	"	5	"	"	"	13.5 - 15.0	Gravelly sand	A-1-b	46								
	"	6	"	"	"	18.5 - 20.0	"	A-1-b(0)	38		29	62	9	9	NP	NP	NP
	"	7	"	"	"	23.5 - 25.0	Silty clay loam	A-4	39								
	"	8	"	"	"	27.5 - 30.0	"	"	26								
25	"	1	13 + 00	30 R	878.0	1.0 - 2.5	Silty clay	A-7-6(21)	17		0	5	59	36	45	26	19
	"	2	"	"	"	3.5 - 5.0	"	"	24								
	"	3	"	"	"	6.0 - 7.5	"	A-7-6	9								
26	C.R. 80 S	1	15 + 32	12 L	878.3	1.0 - 2.5	Gravel	-	10								
	over	2	"	"	"	3.5 - 5.0	Clay	A-6	13								
	Salamonie	3	"	"	"	6.0 - 7.5	"	"	13								
	River	4	"	"	"	8.5 - 10.0	"	"	15								
	"	5	"	"	"	13.5 - 15.0	Sandy Gravel	A-1-b	45								
	"	6	"	"	"	18.5 - 20.0	Clay loam	A-4	28								
	"	7	"	"	"	23.5 - 25.0	"	"	30								
	"	8	"	"	"	28.5 - 30.0	"	"	26								
	"	9	"	"	"	33.5 - 34.1	Limestone	-	-								
27	"	1	16 + 25	6 R	879.3	13.0 - 14.5	Sandy loam	-	9								
	"	2	"	"	"	15.5 - 17.0	"	A-1-b(0)	3		44	39	17	17	NP	NP	NP
	"	3	"	"	"	18.0 - 19.5	"	"	23								
	"	4	"	"	"	20.5 - 22.0	Clay Loam	A-4	26								
	"	5	"	"	"	25.5 - 27.0	Sand	-	75								
	"	6	"	"	"	30.5 - 32.0	Silt	-	56								
	"	7	"	"	"	34.0 - 34.1	Limestone	-	-								

APPENDIX A. (CONTINUED)

Boring No.	Project	Sample No.	Station No.	Offset Ft.	Ground Elevation Ft.	Sample Depth Ft.	Soil Description: Texture	Soil Description: AASHTO	Blow per Ft.	RQD %	Grain Size Distribution: Gravel	Sand	Silt	Clay	LL	PL	PI
28	C.R. 80 S over Salamonie River	1	17 + 03	14 L	879.2	1.0 - 2.5	Clay	A-6(10)	10								
		2	"	"	"	3.5 - 5.0	"	"	14								
		3	"	"	"	6.0 - 7.5	"	"	13								
		4	"	"	"	8.5 - 10.0	"	"	14		0	20	47	33	33	19	14
	"	5	"	"	"	13.5 - 15.0	Sandy Gravel	A-1-b	16								
	"	6	"	"	"	18.5 - 20.0	Clay loam	A-4(1)	22		0	36	43	21	22	17	5
	"	7	"	"	"	23.5 - 25.0	"	"	17								
	"	8	"	"	"	28.5 - 30.0	"	"	28								
29	S.R. 1 over Mud Creek	1	427 + 38	14 L	875.8	1.0 - 2.5	Clay loam	A-6(14)	4								
		2	"	"	"	3.5 - 5.0	"	"	5								
	"	3	"	"	"	6.0 - 7.5	"	"	6		0.6	26.8	48.6	24.0	40.4	19.3	21.1
	"	4	"	"	"	8.5 - 10.0	Sandy loam	A-2-4(0)	6		8.9	66.9	20.0	4.2	NP	NP	NP
	"	5	"	"	"	13.5 - 15.0	Sand	A-3(0)	8								
	"	6	"	"	"	18.5 - 20.0	"	"	40		0.0	90.5	9.5	9.5	NP	NP	NP
	"	7	"	"	"	23.5 - 25.0	Silty clay loam	A-4(4)	7		0.2	22.7	51.5	25.6	22.9	14.1	8.8
	"	8	"	"	"	28.5 - 30.0	Sand	A-3	28								
	"	9	"	"	"	33.5 - 34.0	Clay with limestone fragments	A-7-6(14)	60								
	"	10	"	"	"	38.5 - 39.0	"	"	-								
	"	11	"	"	"	43.0 - 43.5	"	"	-		22.1	24.2	20.2	33.7	50.1	16.5	33.6
30	"	1	428 + 07	23 L	869.0	1.0 - 2.5	Clay loam	A-6(8)	4								
	"	2	"	"	"	3.5 - 5.0	"	"	8		0.8	32.4	43.6	23.2	35.9	21.0	14.9
	"	3	"	"	"	6.0 - 7.5	Sandy loam	A-2-4	3								
	"	4	"	"	"	8.5 - 10.0	"	"	1								
	"	5	"	"	"	13.5 - 15.0	Sand	A-3	10								
	"	6	"	"	"	18.5 - 20.0	"	"	13								
	"	7	"	"	"	23.5 - 25.0	"	"	21								
	"	8	"	"	"	28.5 - 30.0	"	A-3	112								
	"	9	"	"	"	33.5 - 35.0	Clay	A-7-6(14)	47								
	"	10	"	"	"	38.5 - 40.0	"	"	36								
	"	11	"	"	"	43.0 - 45.0	Limestone	-	64								
	"	12	"	"	"	48.5 - 49.0	"	-	50/.3								
	"	13	"	"	"	52.3 - 54.0	"	-	93								
	"	14	"	"	"	58.5 - 58.6	"	-	50/.1								

APPENDIX A. (CONTINUED)

Boring No.	Project	Sample No.	Station No.	Offset Ft.	Ground Elevation Ft.	Sample Depth Ft.	Soil Description		Blow per Ft.	RQD %	Grain Size Distribution				LL	PL	PI
							Texture	AASHTO			Gravel	Sand	Silt	Clay			
31	S.R 1 over	1	428 + 63	16 R	875.5	1.0 - 2.5	Clay loam	A-6	8								
	Mud Creek	2	"	"	"	3.5 - 5.0	"	"	9								
	"	3	"	"	"	6.0 - 7.5	"	"	8								
	"	4	"	"	"	8.5 - 10.0	"	"	12		0.6	21.8	45.9	31.7	41.4	19.7	21.7
	"	5	"	"	"	13.5 - 15.0	Clay	A-7-6(16)	13								
	"	6	"	"	"	18.5 - 20.0	Sandy loam	A-2-4	11								
	"	7	"	"	"	23.5 - 25.0	Sand	A-3	20								
	"	8	"	"	"	28.5 - 30.0	"	"	12								
	"	9	"	"	"	33.5 - 35.0	Clay	-	70								
	"	10	"	"	"	38.5 - 50.0	"	-	50/.0								
32	County 201	1	9 + 74	7 R	981.8	1.0 - 2.5	Silty loam		20								
	over Little	2	"	"	"	3.5 - 5.0	Clay loam	A-4(5)	21								
	Salamonie	3	"	"	"	6.0 - 7.5	"	"	17		0	34	39	27	31	21	10
	River	4	"	"	"	8.5 - 10.0	"	A-4	21								
	"	5	"	"	"	13.5 - 15.0	"	"	21								
	"	6	"	"	"	18.5 - 20.0	"	"	19								
	"	7	"	"	"	23.5 - 25.0	Silty loam	"	32								
	"	8	"	"	"	28.5 - 30.0	Clay loam	"	27								
33	"	1	10 + 31	15 L	981.2	1.0 - 2.5	Clay loam	A-4	21								
	"	2	"	"	"	3.5 - 5.0	"	"	24								
	"	3	"	"	"	6.0 - 7.5	Sandy loam	A-2-4(0)	27		12	60	19	9	NP	NP	NP
	"	4	"	"	"	8.5 - 10.0	Clay loam	A-4	40								
	"	5	"	"	"	13.5 - 15.0	"	"	32								
	"	6	"	"	"	18.5 - 20.0	"	"	27								
	"	7	"	"	"	23.5 - 25.0	"	"	31								
	"	8	"	"	"	28.5 - 30.0	"	"	26								
	"	9	"	"	"	33.5 - 35.0	"	"	31								
	"	10	"	"	"	38.5 - 40.0	"	"	24								
	"	11	"	"	"	43.5 - 45.0	"	"	24								
	"	12	"	"	"	48.5 - 50.0	"	"	26								
34	"	1	12 + 50	15 L	980.2	1.0 - 2.5	Clay	A-6(10)	18								
	"	2	"	"	"	3.5 - 5.0	"	"	28		2	20	43	35	37	23	14
	"	3	"	"	"	6.0 - 7.5	"	"	26								

APPENDIX A. (CONTINUED)

Boring No.	Project	Sample No.	Station No.	Offset Ft.	Ground Elevation Ft.	Sample Depth Ft.	Soil Description: Texture	Soil Description: AASHTO	Blow per Ft.	RQD %	Grain Size Distribution: Gravel	Sand	Silt	Clay	LL	PL	PI
35	County 201 over Walnut Creek	1	9 + 84	6 R	978.1	1.0 - 2.5	Clay loam	A-4(2)	15								
		2	"	"	"	3.5 - 5.0	"	"	11		6	25	43	26	26	20	6
		3	"	"	"	6.0 - 7.5	"	"	11								
	"	4	"	"	"	8.5 - 10.0	"	A-4	19								
	"	5	"	"	"	13.5 - 15.0	"	"	17								
	"	6	"	"	"	18.5 - 20.0	"	"	24								
	"	7	"	"	"	23.5 - 25.0	"	"	22								
	"	8	"	"	"	27.5 - 30.0	"	"	20								
36	"	1	10 + 24	10 L	978.2	1.0 - 2.5	Clay loam	A-4	13								
	"	2	"	"	"	3.5 - 5.0	Clay	A-6	22								
	"	3	"	"	"	6.0 - 7.5	Silty loam	A-4(0)	12		0	32	60	8	NP	NP	NP
	"	4	"	"	"	8.5 - 10.0	Clay loam	A-4	24								
	"	5	"	"	"	13.5 - 15.0	"	"	21								
	"	6	"	"	"	18.5 - 20.0	"	"	30								
	"	7	"	"	"	23.5 - 25.0	"	"	23								
	"	8	"	"	"	28.5 - 30.0	"	"	22								
	"	9	"	"	"	28.5 - 30.0	"	"	22								
	"	10	"	"	"	28.5 - 30.0	"	"	22								
	"	11	"	"	"	28.5 - 30.0	"	"	20								
	"	12	"	"	"	28.5 - 30.0	"	"	20								
37	"	1	9 + 85	5 R	977.1	1.0 - 2.5	Clay loam	A-4	17								
	"	2	"	"	"	3.5 - 5.0	"	"	26								
	"	3	"	"	"	6.0 - 7.5	Clay	A-6	14								
	"	4	"	"	"	8.5 - 10.0	"	"	37								
	"	5	"	"	"	13.5 - 15.0	Clay loam	A-4	20								
	"	6	"	"	"	18.5 - 20.0	"	"	24								
	"	7	"	"	"	23.5 - 25.0	"	"	30								
	"	8	"	"	"	28.5 - 30.0	"	"	37								

APPENDIX A. (CONTINUED)

Boring No.	Project	Sample No.	Station No.	Offset Ft.	Ground Elevation Ft.	Sample Depth Ft.	Soil Description: Texture	Soil Description: AASHTO	Blow per Ft.	RQD %	Grain Size Distribution: Gravel	Sand	Silt	Clay	LL	PL	PI
38	County 201	1	10 + 23	6 L	977.1	1.0 - 2.5	Clay loam	A-4	21								
	over Walnut	2	"	"	"	3.5 - 5.0	"	"	30								
	Creek	3	"	"	"	6.0 - 7.5	"	"	28								
	"	4	"	"	"	8.5 - 10.0	"	"	31								
	"	5	"	"	"	13.5 - 15.0	"	"	31								
	"	6	"	"	"	17.5 - 20.0	"	"	26								
	"	7	"	"	"	23.5 - 25.0	"	"	28								
	"	8	"	"	"	27.5 - 30.0	"	"	30								
	"	9	"	"	"	33.5 - 35.0	"	"	22								
	"	10	"	"	"	37.5 - 40.0	Gravelly sand	"	21								
	"	11	"	"	"	43.5 - 43.8	Limestone	-	-								
39	County 201	1	9 + 74	4 R	957.3	1.0 - 2.5	Clay loam	A-4	24								
	over Little	2	"	"	"	3.5 - 4.5	"	"	50								
	Salamonie	3	"	"	"	6.0 - 7.5	Clay	"	7								
	River	4	"	"	"	8.5 - 10.0	"	"	14								
	"	5	"	"	"	13.5 - 15.0	Clay loam	"	20								
	"	6	"	"	"	17.5 - 18.7	Limestone	-	-								
40	"	1	10 + 27	4 L	956.3	1.0 - 2.5	Sandy loam	A-4	22								
	"	2	"	"	"	3.5 - 5.0	Clay	A-6	17								
	"	3	"	"	"	6.0 - 7.5	"	"	8								
	"	4	"	"	"	8.5 - 10.0	Clay loam	A-4	6								
	"	5	"	"	"	13.5 - 15.0	"	"	18								
	"	6	"	"	"	17.5 - 20.0	"	"	50								
	"	7	"	"	"	20.0 - 25.2	Limestone	-	-								
41	"	1	9 + 40	25 R	954.7	1.0 - 2.5	Clay loam	A-4	11								
	"	2	"	"	"	3.5 - 5.0	Clay	A-6	20								
	"	3	"	"	"	6.0 - 7.5	"	"	21								
42	S.R. 67 over	1	215 + 56	33 L	854.8	1.0 - 2.5	Silty clay loam	A-4	7								
	Glentzer	2	"	"	"	3.5 - 5.0	Clay	A-6(10)	32		3.9	14.9	45.0	36.2	32.0	18.3	13.7
	Perry Ditch	3	"	"	"	6.0 - 7.5	"	"	28								
	"	4	"	"	"	8.5 - 10.0	"	"	16								
	"	5	"	"	"	11.0 - 12.5	"	"	15								
	"	6	"	"	"	13.5 - 15.0	"	"	16								

APPENDIX A. (CONTINUED)

Boring No.	Project	Sample No.	Station No.	Offset Ft.	Ground Elevation Ft.	Sample Depth Ft.	Soil Description		Blow per Ft.	RQD %	Grain Size Distribution				LL	PL	PI
							Texture	AASHTO			Gravel	Sand	Silt	Clay			
43	S.R. 67 over	1	215 + 59	38 R	852.9	1.0 - 2.5	Clay	A-6(14)	23		1.6	12.4	43.1	42.9	36.3	19.8	16.5
	Glentzer	2	"	"	"	3.5 - 5.0	"	"	25								
	Perry Ditch	3	"	"	"	6.0 - 7.5	"	"	17								
	"	4	"	"	"	8.5 - 10.0	Silty clay loam w/silt & sand seams	A-4	7								
44	S.R. 67 over	1	311 + 52	34 L	860.3	1.0 - 2.5	Silty clay loam	A-4	5								
	Schindler	2	"	"	"	3.5 - 5.0	Clay	A-6(12)	28								
	Ditch	3	"	"	"	6.0 - 7.5	"	"	30								
	"	4	"	"	"	8.5 - 10.0	"	"	31		2.3	11.6	46.2	39.9	32.7	17.9	14.8
45	"	1	311 + 23	37 R	860.6	1.0 - 2.5	Silty clay loam	A-4	7								
	"	2	"	"	"	3.5 - 5.0	"	"	18								
	"	3	"	"	"	6.0 - 7.5	Clay	A-6	37								
	"	4	"	"	"	8.5 - 10.0	"	"	34								
46	S.R. 67 over	1	336 + 84	37 L	867.0	1.0 - 2.5	Silty clay loam	A-4	10								
	Luteman	2	"	"	"	3.5 - 5.0	"	"	32								
	Ditch	3	"	"	"	6.0 - 7.5	Clay	A-6	25								
	"	4	"	"	"	8.5 - 10.0	"	"	13								
47	"	1	336 + 96	38.5 R	866.7	1.0 - 2.5	Silty clay loam	A-4	13								
	"	2	"	"	"	3.5 - 5.0	Clay	A-6	35								
	"	3	"	"	"	6.0 - 7.5	"	"	24								
	"	4	"	"	"	8.5 - 10.0	"	"	21								
48	S.R. 67 over	1	367 + 76	37 L	857.0	1.0 - 2.5	Silty clay loam	A-4	9								
	J.J. Adams	2	"	"	"	3.5 - 5.0	Clay	A-6	33								
	Ditch	3	"	"	"	6.0 - 7.5	"	A-7-6(18)	25								
	"	4	"	"	"	8.5 - 10.0	"	"	17		1.0	8.4	34.3	56.3	40.6	21.6	19.0
49	"	1	367 + 83	37 R	857.1	1.0 - 2.5	Silty clay loam	A-4	5								
	"	2	"	"	"	3.5 - 5.0	Clay	A-6	30								
	"	3	"	"	"	6.0 - 7.5	"	A-7-6	30								
	"	4	"	"	"	8.5 - 10.0	"	"	31								

APPENDIX A. (CONTINUED)

Boring No.	Project	Sample No.	Station No.	Offset Ft.	Ground Elevation Ft.	Sample Depth Ft.	Soil Description: Texture	Soil Description: AASHTO	Blow per Ft.	RQD %	Grain Size Distribution: Gravel	Sand	Silt	Clay	LL	PL	PI
50	S.R. 67 over	1	417 + 43	36 L	853.8	1.0 - 2.5	Silty clay loam	A-4	11								
	Beatle	2	"	"	"	3.5 - 5.0	Clay	A-6	36								
	Ditch	3	"	"	"	6.0 - 7.5	"	"	35								
	"	4	"	"	"	8.5 - 10.0	"	A-7-6	32								
51	"	1	417 + 49	32 R	854.2	1.0 - 2.5	Silty clay loam	A-4	10								
	"	2	"	"	"	3.5 - 5.0	Clay	A-6	34								
	"	3	"	"	"	6.0 - 7.5	"	A-7-6	36								
	"	4	"	"	"	8.5 - 10.0	"	"	27								
52	S.R. 67 over	1	429 + 49	33.5 L	852.6	1.0 - 2.5	Silty clay loam	A-4	4								
	Beatle Prong	2	"	"	"	3.5 - 5.0	Clay	A-6	18								
	Ditch	3	"	"	"	6.0 - 7.5	"	"	36								
		4	"	"	"	8.5 - 10.0	"	A-7-6	26								
53	"	1	429 + 51	38 R	852.7	1.0 - 2.5	Silty clay loam	A-4	5								
	"	2	"	"	"	3.5 - 5.0	"	"	10								
	"	3	"	"	"	6.0 - 7.5	Clay	A-6	36								
	"	4	"	"	"	8.5 - 10.0	"	A-7-6	21								
54	Water Street	1	27 + 50	10 R	919.4	1.0 - 2.5	Loam	A-4(1)	11								
	from Charles	2	"	"	"	3.5 - 5.0	"	"	13		6	29	47	18	23	18	5
	St. to Ship St.	3	"	"	"	6.0 - 7.5	Clay	A-6	23								
	"	4	"	"	"	8.5 - 10.0	"	"	21								
	"	5	"	"	"	13.5 - 15.0	"	"	12								
	"	6	"	"	"	17.5 - 20.0	"	"	13								
55	"	1	36 + 18	12 R	911.8	1.0 - 2.5	Clay	A-6	11								
	"	2	"	"	"	3.5 - 5.0	"	"	9								
	"	3	"	"	"	6.0 - 7.5	"	"	15								
	"	4	"	"	"	8.5 - 10.0	"	A-6(11)	15		0	14	47	39	38	28	12
	"	5	"	"	"	13.5 - 15.0	"	"	18								
56	"	1	45 + 40	6 R	910.7	1.0 - 2.5	Clay	A-6	8								
	"	2	"	"	"	3.5 - 5.0	"	"	5								
	"	3	"	"	"	6.0 - 7.5	"	"	12								
	"	4	"	"	"	8.5 - 10.0	"	"	19								
	"	5	"	"	"	11.0 - 12.5	"	"	21								

APPENDIX A. (CONTINUED)

Boring No.	Project	Sample No.	Station No.	Offset Ft.	Ground Elevation Ft.	Sample Depth Ft.	Soil Description		Blow per Ft.	RQD %	Grain Size Distribution				LL	PL	PI
							Texture	AASHTO			Gravel	Sand	Silt	Clay			
57	Water Street	1	52 + 70	5 R	909.9	1.0 - 2.5	Clay	A-6	9								
	from Charles	2	"	"	"	3.5 - 5.0	"	"	8								
	St. to Ship St.	3	"	"	"	6.0 - 7.5	"	"	30								
	"	4	"	"	"	8.5 - 10.0	"	"	29								
	"	5	"	"	"	13.5 - 15.0	"	"	19								
58	"	1	58 + 70	6 R	908.0	1.0 - 2.5	Sand	-	15								
	"	2	"	"	"	3.5 - 5.0	Clay	A-6	8								
	"	3	"	"	"	6.0 - 7.5	"	"	11								
	"	4	"	"	"	8.5 - 10.0	"	"	10								
	"	5	"	"	"	13.5 - 15.0	Sand	-	21								
59	"	1	64 + 80	CL	906.1	1.0 - 2.5	Clay	A-6(13)	7		1	16	41	42	38	23	15
	"	2	"	"	"	3.5 - 5.0	"	"	3								
	"	3	"	"	"	6.0 - 7.5	"	A-6	6								
	"	4	"	"	"	8.5 - 10.0	"	"	8								
	"	5	"	"	"	13.5 - 15.0	Sand	-	33								
60	"	1	7 + 99	15 R	896.8	1.0 - 2.5	Loam	A-4	12								
	"	2	"	"	"	3.5 - 5.0	Clay	A-6	39								
	"	3	"	"	"	6.0 - 7.5	Sandy Loam	-	11								
	"	4	"	"	"	8.5 - 10.0	Gravelly Sand	-	24								
61	S.R. 1 over	1	50 + 09	48 L	953.3	1.0 - 2.5	Silty clay loam	A-6(12)	18		1.0	20.4	54.3	24.3	39.7	24.8	14.9
	Hoppes	2	"	"	"	3.5 - 5.0	Clay	A-7-b(18)	21		0.3	17.1	48.9	33.7	42.4	20.9	21.5
	Ditch	3	"	"	"	6.0 - 7.5	"	"	18								
	"	4	"	"	"	8.5 - 10.0	Silty Clay Loam	A-4	20								
	"	5	"	"	"	11.0 - 12.5	"	"	12								
	"	6	"	"	"	13.5 - 15.0	"	"	21								
	"	7	"	"	"	16.0 - 17.5	Silty Loam	"	31								
	"	8	"	"	"	18.5 - 20.0	"	"	26								
62	"	1	50 + 09	50 L	953.3	9.0 - 10.2	Silty Loam	A-4(2)	-		0.6	13.6	72.0	13.8	21.4	15.6	5.8
	"	2	"	"	"	12.0 - 14.0	"	A-4(5)	-		0.1	5.4	74.1	20.4	24.2	17.0	7.2
	"	3	"	"	"	18.0 - 19.6	"	A-4(3)	-		5.7	19.5	55.4	19.4	22.0	14.7	7.3

APPENDIX A. (CONTINUED)

Boring No.	Project	Sample No.	Station No.	Offset Ft.	Ground Elevation Ft.	Sample Depth Ft.	Soil Description: Texture	Soil Description: AASHTO	Blow per Ft.	RQD %	Grain Size Distribution: Gravel	Sand	Silt	Clay	LL	PL	PI
63	S.R. 1 over Hoppes Ditch	1	49 + 74	25 L	955.1	1.0 - 2.5	Silty Clay Loam	A-6	10								
	"	2	"	"	"	3.5 - 5.0	Sandy Loam	A-4(0)	7		10.9	48.8	33.9	6.4	NP	NP	NP
	"	3	"	"	"	6.0 - 7.5	Silty Loam	"	22		3.0	13.3	73.3	10.4	NP	NP	NP
	"	4	"	"	"	8.5 - 10.0	Silty Clay Loam	A-4	19								
	"	5	"	"	"	11.0 - 12.5	"	"	19								
	"	6	"	"	"	13.5 - 15.0	"	"	22								
	"	7	"	"	"	16.0 - 17.5	Silty loam w/sand & gravel seams	"	25								
	"	8	"	"	"	18.0 - 20.0	"	"	23								
64	S.R. 26 over Crooked Creek	1	49 + 60	34 L	879.8	1.0 - 2.5	Sandy Loam	A-6	3								
		2	"	"	"	3.5 - 5.0	Sand	"	18								
		3	"	"	"	6.0 - 7.5	"	A-2-4(0)	14		1.7	85.1	13.2	13.2	NP	NP	NP
65	"	1	50 + 12	26 R	880.5	1.0 - 2.5	Sandy Loam	A-6(2)	14		3.4	49.4	29.1	18.1	28.6	17.3	11.3
	"	2	"	"	"	3.5 - 5.0	"	A-6	19								
	"	3	"	"	"	6.0 - 7.5	Sand	A-1-b(0)	16		18.2	78.8	3.0	3.0	NP	NP	NP
66	S.R. 18 over Williams Ditch	1	870 + 15	22 R	838.0	1.0 - 2.5	Loam	A-6	3								
		2	"	"	"	3.5 - 5.0	"	"	7								
		3	"	"	"	5.0 - 7.5	"	A-6(5)	10								
	"	4	"	"	"	8.5 - 10.0	"	"	12		4.8	30.4	45.0	19.8	29.4	17.9	11.5
	"	5	"	"	"	13.5 - 15.0	Silty Loam	"	16		8.1	23.9	51.0	17.0	26.0	15.3	10.7
	"	6	"	"	"	18.5 - 20.0	Sandy loam	A-2-4(0)	21								
	"	7	"	"	"	23.5 - 25.0	"	"	26		0	78.0	22.0	0.0	NP	NP	NP
	"	8	"	"	"	28.5 - 30.0	"	"	23								
	"	9	"	"	"	33.5 - 35.0	"	"	25								

APPENDIX A. (CONTINUED)

Boring No.	Project	Sample No.	Station No.	Offset Ft.	Ground Elevation Ft.	Sample Depth Ft.	Soil Description		Blow per Ft.	RQD %	Grain Size Distribution				LL	PL	PI
							Texture	AASHTO			Gravel	Sand	Silt	Clay			
67	S.R. 18 Over Williams Ditch	1	870 + 52	22 L	834.0	1.0 - 2.5	Loam	A-6	2								
	"	2	"	"	"	3.5 - 5.0	"	"	3								
	"	3	"	"	"	6.0 - 7.5	"	"	7								
	"	4	"	"	"	8.5 - 10.0	Silty loam	"	13								
	"	5	"	"	"	13.5 - 15.0	"	"	24								
	"	6	"	"	"	18.5 - 20.0	Sandy loam	A-2-4	4								
	"	7	"	"	"	23.5 - 25.0	Silty Loam	A-4(3)	21								
	"	8	"	"	"	28.5 - 30.0	"	"	29		4.6	19.4	56.2	19.8	20.7	13.3	7.4
	"	9	"	"	"	33.5 - 35.0	"	"	46								
	"	10	"	"	"	37.5 - 40.0	"	"	36								
	"	11	"	"	"	43.5 - 45.0	Clay loam	A-4(4)	50		10.4	22.7	46.5	20.4	25.3	15.2	10.1
	"	12	"	"	"	47.5 - 50.0	"	"	63								
68	"	1	870 + 58	22 R	834.0	1.0 - 2.5	Silty Clay	-	3								
	"	2	"	"	"	3.5 - 5.0	Loam	A-6	4								
	"	3	"	"	"	6.0 - 7.5	Sand	A-2-4(0)	6		11.5	74.7	13.8	13.8	NP	NP	NP
	"	4	"	"	"	8.5 - 10.0	"	-	6								
	"	5	"	"	"	13.5 - 15.0	Silty loam	A-6	4								
	"	6	"	"	"	18.5 - 20.0	"	"	18								
	"	7	"	"	"	23.5 - 25.0	Sandy Loam	A-2-4	21								
	"	8	"	"	"	28.5 - 30.0	"	"	41								
69	"	1	870 + 95	22 L	841.0	1.0 - 2.5	Silty Clay	-	2								
	"	2	"	"	"	3.5 - 5.0	Sandy loam	A-2-4(0)	2		5.0	60.6	30.8	3.6	NP	NP	NP
	"	3	"	"	"	6.0 - 7.5	"	"	11								
	"	4	"	"	"	8.5 - 10.0	"	A-2-4	10								
	"	5	"	"	"	13.5 - 15.0	"	"	3								
	"	6	"	"	"	18.5 - 20.0	Silty loam	A-4	18								
	"	7	"	"	"	23.5 - 25.0	"	"	46								
	"	8	"	"	"	28.5 - 30.0	"	"	30								

APPENDIX A. (CONTINUED)

Boring No.	Project	Sample No.	Station No.	Offset Ft.	Ground Elevation Ft.	Sample Depth Ft.	Soil Description Texture	Soil Description AASHTO	Blow per Ft.	RQD %	Grain Size Distribution Gravel	Sand	Silt	Clay	LL	PL	PI
70	S.R. 18 over	1	980 + 28	22 R	835.5	1.0 - 2.5	Silty Clay	A-7-6	9								
	Louis	2	"	"	"	3.5 - 5.0	"	"	11								
	Ditch	3	"	"	"	6.0 - 7.5	"	A-7-6(26)	6		0	11.8	50.5	37.7	47.4	18.7	28.7
	"	4	"	"	"	8.5 - 10.0	"	"	5								
	"	5	"	"	"	13.5 - 15.0	Silty clay loam	A-6	4								
	"	6	"	"	"	18.5 - 20.0	"	"	12								
	"	7	"	"	"	23.5 - 25.0	Loam	A-6(5)	19								
	"	8	"	"	"	28.5 - 30.0	"	"	21								
	"	9	"	"	"	33.5 - 35.0	"	"	22		13.4	20.6	49.3	16.7	26.7	15.9	10.8
	"	10	"	"	"	37.5 - 40.0	"	"	37								
71	"	1	980 + 79	25 L	829.0	1.0 - 2.5	Silty clay loam	A-6	3								
	"	2	"	"	"	3.5 - 5.0	"	"	5								
	"	3	"	"	"	6.0 - 7.5	Silty clay	A-7-6	7								
	"	4	"	"	"	8.5 - 10.0	"	"	8								
	"	5	"	"	"	13.5 - 15.0	Sandy loam	A-2-4	12								
	"	6	"	"	"	18.5 - 20.0	Loam	A-6	15								
	"	7	"	"	"	23.5 - 25.0	Loam	"	12								
	"	8	"	"	"	28.5 - 30.0	"	"	25								
	"	9	"	"	"	33.5 - 35.0	"	"	33								
	"	10	"	"	"	38.5 - 40.0	"	"	31								
	"	11	"	"	"	43.5 - 45.0	"	"	33								
	"	12	"	"	"	48.5 - 50.0	"	"	34								
72	"	1	980 + 81	22 R	825.0	1.0 - 2.5	Silty Clay loam	A-6(11)	3								
	"	2	"	"	"	3.5 - 5.0	"	"	7								
	"	3	"	"	"	6.0 - 7.5	"	"	16		0	11.3	67.3	21.4	32.3	19.8	12.5
	"	4	"	"	"	8.5 - 10.0	"	"	24								
	"	5	"	"	"	13.5 - 15.0	Sandy loam	A-2-4	21								
	"	6	"	"	"	18.5 - 20.0	"	"	19								
	"	7	"	"	"	23.5 - 25.0	Loam	A-6	17								
	"	8	"	"	"	28.5 - 30.0	"	"	22								
	"	9	"	"	"	33.5 - 35.0	"	"	31								

APPENDIX A. (CONTINUED)

Boring No.	Project	Sample No.	Station No.	Offset Ft.	Ground Elevation Ft.	Sample Depth Ft.	Soil Description: Texture	Soil Description: AASHTO	Blow per Ft.	RQD %	Grain Size Distribution: Gravel	Sand	Silt	Clay	LL	PL	PI
73	S.R. 18 over	1	981 + 33	22 L	833.9	1.0 - 2.5	Silty clay	A-7-6	9								
	Louis	2	"	"	"	3.5 - 5.0	"	"	7								
	Ditch	3	"	"	"	6.0 - 7.5	"	"	7								
	"	4	"	"	"	8.5 - 10.0	Silty clay loam	A-6	20								
	"	5	"	"	"	13.5 - 15.0	Sandy loam	A-2-4(6)	50								
	"	6	"	"	"	18.5 - 20.0	"	"	50		0	68.0	32.0	0	NP	NP	NP
	"	7	"	"	"	23.5 - 25.0	"	"	24								
	"	8	"	"	"	28.5 - 30.0	"	"	24								
	"	9	"	"	"	33.5 - 35.0	Loam	A-6	34								
	"	10	"	"	"	38.5 - 40.0	"	"	23								
	"	11	"	"	"	43.5 - 45.0	"	"	26								
74	S.R. 67 over	1	758 + 05	20 R	962.6	1.0 - 2.5	Silty clay loam	-	4								
	the	2	"	"	"	3.5 - 5.0	"	-	6								
	Pennsylvania	3	"	"	"	8.5 - 10.0	Clay & clay loam	-	25								
	R.R.	4	"	"	"	13.5 - 15.0	"	-	23								
	"	5	"	"	"	18.5 - 20.0	"	-	16								
	"	6	"	"	"	23.5 - 25.0	"	-	18								
	"	7	"	"	"	28.5 - 30.0	"	-	17								
75	"	1	758 + 12	86 L	926.6	1.0 - 2.5	Fill	-	16								
	"	2	"	"	"	3.5 - 5.0	Silty clay	-	8								
	"	3	"	"	"	8.5 - 10.0	Clay or clay loam	-	19								
	"	4	"	"	"	13.5 - 15.0	"	-	14								
	"	5	"	"	"	18.5 - 20.0	"	-	14								
	"	6	"	"	"	23.5 - 25.0	"	-	23								
	"	7	"	"	"	28.5 - 30.0	"	-	21								
	"	8	"	"	"	33.5 - 35.0	"	-	17								
	"	9	"	"	"	38.5 - 40.0	"	-	17								
	"	10	"	"	"	43.5 - 45.0	"	-	19								
	"	11	"	"	"	48.5 - 50.0	"	-	24								

APPENDIX A. (CONTINUED)

Boring No.	Project	Sample No.	Station No.	Offset Ft.	Ground Elevation Ft.	Sample Depth Ft.	Soil Description		Blow per Ft.	Grain Size Distribution				LL	PL	PI
							Texture	AASHTO		Gravel	Sand	Silt	Clay			
76	S.R 67 over	1	758 + 90	20 L	963.4	1.0 - 2.5	Fill	-	5							
	the	2	"	"	"	3.5 - 5.0	Silty clay loam	-	8							
	Pennsylvania	3	"	"	"	8.5 - 10.0	"	-	23							
	R.R.	4	"	"	"	13.5 - 15.0	Clay loam	-	18							
	"	5	"	"	"	18.5 - 20.0	"	-	17							
	"	6	"	"	"	23.5 - 25.0	"	-	14							
	"	7	"	"	"	28.5 - 30.0	"	-	15							
77	"	1	759 + 30	20 R	963.1	1.0 - 2.5	Silty loam	-	12							
	"	2	"	"	"	3.5 - 5.0	"	-	14							
	"	3	"	"	"	8.5 - 10.0	Clay loam	-	38							
	"	4	"	"	"	13.5 - 15.0	"	-	19							
	"	5	"	"	"	18.5 - 20.0	"	-	18							
	"	6	"	"	"	23.5 - 25.0	"	-	19							
	"	7	"	"	"	28.5 - 30.0	"	-	16							
78	"	1	763 + 00	CL	960.7	0.0 - 1.0	Clay loam	-	-							
	"	2	"	"	"	1.0 - 2.0	Silty clay loam	-	-							
	"	3	"	"	"	6.0 - 8.0	"	-	-							
79	"	1	752 + 70	40 L	958.1	0.0 - 2.0	Silty clay loam	-	-							
	"	2	"	"	"	6.0 - 7.0	"	-	-							
	"	3	"	"	"	7.0 - 8.0	Clay loam	-	-							
80	S.R. 67 over	1	82 + 77	36 R	842.2	2.0 - 3.5	Silty clay loam		5							
	Oakley Ditch	2	"	"	"	4.5 - 6.0	"		8							
	"	3	"	"	"	7.0 - 8.5	"		8							
	"	4	"	"	"	9.5 - 11.0	"		11							
	"	5	"	"	"	14.5 - 16.0	"		29							
	"	6	"	"	"	19.5 - 21.0	Sand		18							
	"	7	"	"	"	24.5 - 26.0	Sandy Loam		23							
	"	8	"	"	"	29.5 - 31.0	"		23							

APPENDIX A. (CONTINUED)

Boring No.	Project	Sample No.	Station No.	Offset Ft.	Ground Elevation Ft.	Sample Depth Ft.	Soil Description		Blow per Ft.	RQD %	Grain Size Distribution				LL	PL	PI
							Texture	AASHTO			Gravel	Sand	Silt	Clay			
81	S.R. 67 over Oakley Ditch	1	82 + 55	25 R	849.3	2.0 - 3.5	Silty clay loam		10								
		2	"	"	"	4.5 - 6.0	"		18								
	"	3	"	"	"	7.0 - 8.5	"		26								
	"	4	"	"	"	9.5 - 11.0	"		25								
	"	5	"	"	"	14.5 - 16.0	Sand		10								
	"	6	"	"	"	19.5 - 21.0	Silty clay loam		29								
	"	7	"	"	"	24.5 - 26.0	Gravelly sand		24								
	"	8	"	"	"	29.5 - 31.0	"		18								
82	"	1	83 + 23	33 L	844.9	2.0 - 3.5	Silty clay loam		12								
	"	2	"	"	"	4.5 - 6.0	"		8								
	"	3	"	"	"	7.0 - 8.5	"		12								
	"	4	"	"	"	9.5 - 11.0	"		23								
	"	5	"	"	"	14.5 - 16.0	Sandy loam		28								
	"	6	"	"	"	19.5 - 21.0	Silty clay		29								
	"	7	"	"	"	24.5 - 26.0	Sandy loam		8								
	"	8	"	"	"	29.5 - 31.0	"		13								
	"	9	"	"	"	34.0 - 36.0	"		13								
	"	10	"	"	"	39.5 - 41.0	"		18								
	"	11	"	"	"	44.5 - 45.5	Silty clay loam		60								
	"	12	"	"	"	49.5 - 50.0	"		60								
83	S.R. 27	1	370 + 00	CL	1007.4	3.0 - 4.0	Clay	A-6									
84	"	1	373 + 00	6 R	1007.0	0.2 - 6.0	Clay	A-6									
85	"	1	376 + 00	17 L	1006.7	0.5 - 6.0	Clay	A-6									
86	"	1	379 + 00	12 R	1012.6	0.4 - 6.0	Clay	A-6									
87	"	1	382 + 00	12 L	1018.2	3.0 - 4.0	Clay	A-6(13)			-	21	30	49	40	18	22
	"	2	"	"	"	8.0 - 9.0	"	"									
88	"	1	385 + 00	12 R	1019.4	0.2 - 1.0	Clay	A-6									
	"	2	"	"	"	1.0 - 11.0	"	"									

APPENDIX A. (CONTINUED)

Boring No.	Project	Sample No.	Station No.	Offset Ft.	Ground Elevation Ft.	Sample Depth Ft.	Soil Description Texture	Soil Description AASHTO	Blow per Ft.	RQD %	Grain Size Distribution Gravel	Sand	Silt	Clay	LL	PL	PI
89	S.R. 27	1	388 + 00	12 L	1014.8	0.2 - 2.0	Clay	A-6									
	"	2	"	"	"	2.0 - 8.0	"	"									
90	"	1	391 + 00	12 R	1012.5	0.5 - 2.0	Clay	A-6									
	"	2	"	"	"	2.0 - 6.0	"	"									
91	"	1	394 + 10	12 L	1011.0	0.3 - 2.0	Clay	A-6									
	"	2	"	"	"	2.0 - 4.0	"	"									
	"	3	"	"	"	4.0 - 8.0	"	"									
92	"	1	394 + 00	35 L	1006.8	1.0 - 2.0	Clay	A-6									
	"	2	"	"	"	2.0 - 5.0	"	"									
93	"	1	397 + 00	12 R	1011.5	0.2 - 1.0	Clay	A-6									
	"	2	"	"	"	1.0 - 8.0	"	"									
94	"	1	400 + 00	12 L	1013.2	0.2 - 7.0	Clay	A-6									
95	"	1	403 + 00	12 R	1017.1	0.5 - 1.5	Clay	A-6									
	"	2	"	"	"	1.5 - 6.0	"	"									
96	"	1	406 + 00	12 L	1018.0	0.2 - 1.5	Clay	A-6									
	"	2	"	"	"	1.5 - 8.0	"	"									
97	"	1	406 + 00	50 L	1015.0	4.0 - 8.0	Clay	A-6									
98	"	1	409 + 00	12 R	1022.1	0.3 - 1.0	Clay	A-6									
	"	2	"	"	"	1.0 - 4.0	"	"									
	"	3	"	"	"	4.0 - 7.0	"	"									
99	"	1	412 + 00	12 L	1020.1	0.2 - 1.0	Clay	A-6									
	"	2	"	"	"	1.0 - 6.0	"	"									
100	"	1	415 + 00	12 R	1018.1	0.2 - 2.0	Clay	A-6									
	"	2	"	"	"	2.0 - 9.0	"	"									
101	"	1	418 + 00	12 L	1016.4	0.2 - 2.0	Clay	A-6			-	26	36	38	35	18	17
	"	2	"	"	"	2.0 - 6.0	"	"			-	18	39	43	40	22	18

APPENDIX A. (CONTINUED)

Boring No.	Project	Sample No.	Station No.	Offset Ft.	Ground Elevation Ft.	Sample Depth Ft.	Soil Description: Texture	Soil Description: AASHTO	Blow per Ft.	RQD %	Grain Size Distribution: Gravel	Sand	Silt	Clay	LL	PL	PI
102	S.R. 27	1	421 + 00	12 R	1015.4	0.3 - 2.5	Clay	A-6(8)			-	43	20	37	40	22	18
	"	2	"	"	"	2.5 - 6.0	"	A-6									
103	"	1	424 + 00	12 L	1015.1	0.2 - 3.0	Clay	A-6			-						
	"	2	"	"	"	3.0 - 5.0	"	A-7-6			-	25	31	44	57	24	33
	"	3	"	"	"	5.0 - 7.0	"	A-7-6(19)									
	"	4	"	"	"	7.0 - 8.0	"	A-7-6									
104	"	1	427 + 00	12 R	1015.1	0.2 - 1.0	Clay	A-6									
	"	2	"	"	"	1.0 - 8.0	"	"									
105	"	1	430 + 00	12 L	1019.6	0.3 - 1.5	Clay	A-6									
	"	2	"	"	"	1.5 - 6.0	"	"									
106	"	1	433 + 00	12 R	1019.1	0.2 - 1.0	Clay	A-6									
	"	2	"	"	"	1.0 - 6.0	"	"									
107	"	1	436 + 00	12 L	1016.4	0.5 - 1.0	Clay	A-6									
	"	2	"	"	"	1.0 - 6.0	"	"									
108	"	1	439 + 00	12 R	1013.9	0.3 - 1.5	Clay	A-6									
	"	2	"	"	"	1.5 - 6.0	"	"									
109	"	1	439 + 75	75 L	1012.8	4.0 - 6.0	Clay	A-7-6									
110	"	1	442 + 00	12 L	1013.4	0.2 - 5.0	Clay	A-6									
	"	2	"	"	"	5.0 - 8.0	"	A-7-6(20)			-	16	31	53	64	25	39
111	"	1	445 + 00	12 R	1015.6	0.2 - 1.0	Clay	A-6									
	"	2	"	"	"	1.0 - 6.0	"	"									
112	"	1	448 + 00	12 L	1022.0	0.3 - 9.0	Clay	A-6									
113	"	1	451 + 00	12 R	1016.0	0.3 - 1.0	Sandy loam	A-4									
	"	2	"	"	"	1.0 - 3.0	Clay	A-7-6									
	"	3	"	"	"	3.0 - 6.0	"	A-6									
114	"	1	452 + 20	35 R	1009.4	0.0 - 1.0	Clay	A-7-6									
	"	2	"	"	"	5.0 - 6.0	"	A-6									

APPENDIX A. (CONTINUED)

Boring No.	Project	Sample No.	Station No.	Offset Ft.	Ground Elevation Ft.	Sample Depth Ft.	Soil Description		Blow per Ft.	RQD %	Grain Size Distribution				LL	PL	PI
							Texture	AASHTO			Gravel	Sand	Silt	Clay			
115	S.R. 27	1	454 + 10	12 L	1016.8	0.2 - 1.0	Clay	A-6									
	"	2	"	"	"	1.0 - 2.5	"	A-7-6									
	"	3	"	"	"	2.5 - 7.0	"	A-6									
116	"	1	457 + 00	12 R	1019.8	0.4 - 6.0	Clay	A-6									
117	"	1	460 + 00	12 L	1019.7	0.2 - 2.0	Clay	A-6									
	"	2	"	"	"	2.0 - 4.0	"	A-7-6									
	"	3	"	"	"	4.0 - 6.0	"	"									
	"	4	"	"	"	6.0 - 8.0	"	A-6									
118	"	1	"	"	"	0.2 - 1.0	Clay	A-6									
	"	2	"	"	"	1.0 - 6.0	"	"									
119	"	1	466 + 00	12 L	1018.6	0.2 - 1.0	Clay	A-6									
	"	2	"	"	"	1.0 - 6.0	"	"									
120	"	1	469 + 00	12 R	1016.8	0.2 - 2.0	Clay	A-6									
	"	2	"	"	"	2.0 - 3.0	"	A-7-6									
	"	3	"	"	"	3.0 - 4.0	"	"									
	"	4	"	"	"	4.0 - 8.0	"	A-6									
121	"	1	472 + 00	12 L	1014.7	0.2 - 1.5	Clay	A-6									
	"	2	"	"	"	1.5 - 8.0	"	"									
122	"	1	474 + 50	30 L	1011.3	4.0 - 7.0	Clay	A-6									
123	"	1	475 + 00	12 R	1012.6	0.2 - 0.5	Loam	A-4(3)			-	52	32	16	26	18	8
	"	2	"	"	"	0.5 - 2.0	Clay	A-6(13)			-	28	34	38	40	18	22
	"	3	"	"	"	2.0 - 6.0	"	A-7-6									
	"	4	"	"	"	6.0 - 9.0	"	"									
124	"	1	478 + 00	12 L	1010.6	0.2 - 2.0	Clay	A-6									
	"	2	"	"	"	2.0 - 4.0	"	"									
	"	3	"	"	"	4.0 - 8.0	"	"									
125	"	1	481 + 00	12 R	1007.2	0.2 - 1.0	Clay	A-6									
	"	2	"	"	"	1.0 - 2.0	Clay Loam	"									
	"	3	"	"	"	2.0 - 3.0	"	A-6(8)			-	28	48	24	30	19	11
	"	4	"	"	"	3.0 - 6.0	Clay	A-7-6									

APPENDIX A. (CONTINUED)

Boring No.	Project	Sample No.	Station No.	Offset Ft.	Ground Elevation Ft.	Sample Depth Ft.	Soil Description		Blow per Ft.	RQD %	Grain Size Distribution				LL	PL	PI
							Texture	AASHTO			Gravel	Sand	Silt	Clay			
126	S.R. 27	1	483 + 00	12 L	1005.6	0.2 - 1.5	Clay	A-6									
	"	2	"	"	"	1.5 - 8.0	Clay loam	"									
127	"	1	484 + 80	33 R	1003.0	1.0 - 2.0	Clay	A-7-6(12)			-	26	17	57	41	22	19
	"	2	"	"	"	4.0 - 5.0	"	A-7-6									
128	"	1	487 + 00	12 R	1004.7	0.2 - 1.0	Clay	A-6									
	"	2	"	"	"	1.0 - 4.0	"	"									
	"	3	"	"	"	4.0 - 6.0	"	A-6									
129	"	1	489 + 70	35 L	995.2	2.0 - 3.0	Clay	A-7-6									
	"	2	"	"	"	5.0 - 6.0	"	"									
130	"	1	490 + 00	12 L	1002.0	0.3 - 2.0	Clay	A-6									
	"	2	"	"	"	2.0 - 5.0	"	A-7-6									
	"	3	"	"	"	5.0 - 8.0	"	A-6									
131	"	1	493 + 00	12 R	1007.0	0.3 - 1.0	Clay loam	A-6									
	"	2	"	"	"	1.0 - 10.0	Clay	"									
132	"	1	497 + 00	12 L	999.5	0.3 - 2.0	Clay	A-6									
	"	2	"	"	"	2.0 - 4.0	"	"									
	"	3	"	"	"	4.0 - 5.0	"	A-7-6									
	"	4	"	"	"	5.0 - 8.0	"	A-6									
133	"	1	497 + 80	25 L	994.4	0.0 - 1.0	Clay	A-7-6(12)			-	41	28	31	48	23	25
	"	2	"	"	"	5.0 - 6.0	"	A-7-6(17)			-	26	34	40	50	22	28
134	"	1	499 + 00	12 R	1000.8	0.5 - 2.0	Clay	A-6									
	"	2	"	"	"	2.0 - 4.0	"	"									
	"	3	"	"	"	4.0 - 9.0	"	"									
135	"	1	502 + 00	12 L	1001 8	0.4 - 2.0	Clay	A-6									
	"	2	"	"	"	2.0 - 3.0	"	A-7-6									
	"	3	"	"	"	3.0 - 6.0	"	"									
	"	4	"	"	"	6.0 - 12.0	"	A-6									
136	"	1	505 + 00	12 R	998.2	0.2 - 2.0	Clay	A-6									
	"	2	"	"	"	2.0 - 4.0	"	"									
	"	3	"	"	"	4.0 - 11.0	"	A-6(12)			-	25	30	45	39	19	20

APPENDIX A. (CONTINUED)

Boring No.	Project	Sample No.	Station No.	Offset Ft.	Ground Elevation Ft.	Sample Depth Ft.	Soil Description		Blow per Ft.	RQD %	Grain Size Distribution				LL	PL	PI
							Texture	AASHTO			Gravel	Sand	Silt	Clay			
137	S.R. 27	1	508 + 00	12 L	993.2	0.3 - 3.0	Clay	A-6									
	"	2	"	"	"	3.0 - 7.0	"	A-7-6									
138	"	1	511 + 00	12 R	988.8	0.3 - 4.0	Clay	A-6									
	"	2	"	"	"	4.0 - 6.0	"	"									
139	"	1	514 + 00	12 L	985.9	0.2 - 2.0	Clay	A-6									
	"	2	"	"	"	2.0 - 8.0	"	"									
140	"	1	517 + 00	12 R	980.2	0.2 - 1.0	Clay	A-6									
	"	2	"	"	"	1.0 - 6.0	"	"									
141	"	1	520 + 00	12 L	976.7	0.3 - 2.0	Clay	A-6									
	"	2	"	"	"	2.0 - 3.0	"	"									
	"	3	"	"	"	3.0 - 8.0	"	A-7-6									
142	"	1	522 + 00	25 R	973.5	0.3 - 1.0	Clay loam	A-6									
	"	2	"	"	"	2.0 - 3.0	Clay	A-7-6									
	"	3	"	"	"	5.0 - 6.0	Clay loam	A-6									
143	"	1	523 + 00	12 R	976.0	0.3 - 3.0	Clay	A-6									
	"	2	"	"	"	3.0 - 8.0	"	"									
144	"	1	523 + 80	30 L	973.9	5.5 - 6.5	Clay	"									
145	"	1	527 + 00	12 L	977.2	0.2 - 1.0	Clay	A-6									
	"	2	"	"	"	1.0 - 2.0	"	"									
	"	3	"	"	"	2.0 - 7.0	"	A-7-6									
146	"	1	527 + 00	25 L	975.0	1.0 - 2.0	Clay	A-6									
	"	2	"	"	"	4.0 - 5.0	"	"									
147	"	1	529 + 00	12 R	979.8	0.2 - 2.0	Sandy clay loam	A-2-6									
	"	2	"	"	"	2.0 - 6.0	Clay	A-7-6									
148	"	1	532 + 00	12 L	981.4	0.2 - 1.0	Clay	A-6									
	"	2	"	"	"	1.0 - 3.0	"	A-7-6									
	"	3	"	"	"	3.0 - 6.0	"	A-6									
	"	4	"	"	"	6.0 - 9.0	"	A-7-6									
	"	5	"	"	"	9.0 - 10.0	"	"									

APPENDIX A. (CONTINUED)

Boring No.	Project	Sample No.	Station No.	Offset Ft.	Ground Elevation Ft.	Sample Depth Ft.	Soil Description		Blow per Ft.	RQD %	Grain Size Distribution				LL	PL	PI
							Texture	AASHTO			Gravel	Sand	Silt	Clay			
149	S.R. 27	1	535 + 00	12 R	980.0	0.2 - 1.0	Clay	A-6									
	"	2	"	"	"	1.0 - 6.0	"	A-7-6									
	"	3	"	"	"	6.0 - 10.0	"	A-6									
150	"	1	538 + 00	12 L	977.1	0.2 - 2.0	Clay loam	A-2-6									
	"	2	"	"	"	2.0 - 3.0	Clay	A-7-6									
	"	3	"	"	"	3.0 - 6.0	"	"									
	"	4	"	"	"	6.0 - 8.0	"	A-6									
151	"	1	541 + 00	12 R	976.0	0.3 - 5.0	Clay	A-7-6									
	"	2	"	"	"	5.0 - 8.0	"	A-6									
152	"	1	544 + 00	12 L	974.5	0.2 - 1.0	Clay	A-6									
	"	2	"	"	"	1.0 - 6.0	"	A-7-6									
	"	3	"	"	"	6.0 - 8.0	"	A-6									
153	"	1	547 + 00	12 R	967.6	0.3 - 2.0	Sandy clay loam	A-2-6									
	"	2	"	"	"	2.0 - 5.0	Clay	A-7-6									
	"	3	"	"	"	5.0 - 8.0	"	A-6									
154	"	1	550 + 00	12 L	965.5	0.2 - 2.0	Clay	A-6									
	"	2	"	"	"	2.0 - 4.0	"	A-7-6									
	"	3	"	"	"	4.0 - 5.0	"	A-6									
	"	4	"	"	"	5.0 - 8.0	"	A-6(8)			-	49	19	32	38	18	20
155	"	1	550 + 75	39 R	960.2	1.0 - 2.0	Clay	A-7-6									
	"	2	"	"	"	3.0 - 4.0	"	"									
	"	3	"	"	"	8.0 - 9.0	Sandy loam	A-4(1)			-	61	20	19	21	15	6
156	"	1	552 + 00	12 R	964.6	1.0 - 2.0	Sandy clay loam	A-2-6									
	"	2	"	"	"	2.0 - 4.0	Clay	A-7-6									
	"	3	"	"	"	4.0 - 8.0	"	A-7-6(20)			-	21	36	43	69	26	43
157	"	1	553 + 00	30 L	963.4	1.5 - 4.0	Clay	A-6									
	"	2	"	"	"	4.0 - 7.0	"	A-7-6									

APPENDIX A. (CONTINUED)

Boring No.	Project	Sample No.	Station No.	Offset Ft.	Ground Elevation Ft.	Sample Depth Ft.	Soil Description		Blow per Ft.	RQD %	Grain Size Distribution				LL	PL	PI
							Texture	AASHTO			Gravel	Sand	Silt	Clay			
158	S.R. 27	1	556 + 00	12 L	966.4	0.5 - 2.0	Clay loam	A-2-6									
	"	2	"	"	"	2.0 - 4.0	Clay	A-7-6									
	"	3	"	"	"	4.0 - 5.0	"	"									
	"	4	"	"	"	5.0 - 6.0	"	A-6									
	"	5	"	"	"	6.0 - 8.0	"	A-7-6									
159	"	1	559 + 00	12 R	971.0	0.3 - 3.0	Clay	A-7-6									
	"	2	"	"	"	3.0 - 4.0	"	A-6									
	"	3	"	"	"	4.0 - 6.0	"	A-7-6									
160	"	1	562 + 00	12 L	976.6	0.4 - 2.0	Clay	A-7-6									
	"	2	"	"	"	2.0 - 5.0	"	A-6									
	"	3	"	"	"	5.0 - 8.0	"	"									
161	"	1	565 + 00	12 R	976.2	0.3 - 2.0	Clay	A-7-6									
	"	2	"	"	"	2.0 - 4.0	"	"									
	"	3	"	"	"	4.0 - 8.0	"	A-6									
162	"	1	568 + 00	12 L	974.2	0.2 - 2.0	Sandy clay loam	A-2-6									
	"	2	"	"	"	2.0 - 4.0	Clay	A-7-6									
	"	3	"	"	"	4.0 - 6.0	"	A-6									
	"	4	"	"	"	6.0 - 8.0	"	"									
163	"	1	569 + 30	25 L	971.0	0.0 - 1.0	Clay	A-7-6(14)									
	"	2	"	"	"	4.0 - 5.0	"	"			-	48	15	37	65	22	43
164	"	1	571 + 00	12 R	979.2	0.5 - 2.0	Clay	A-7-6									
	"	2	"	"	"	2.0 - 3.0	Sandy Clay loam	A-2-6									
	"	3	"	"	"	3.0 - 6.0	Clay	A-7-6									
165	"	1	574 + 00	12 L	977.4	0.2 - 1.0	Sandy clay loam	A-2-6									
	"	2	"	"	"	1.0 - 3.0	Clay	A-7-6									
	"	3	"	"	"	3.0 - 7.0	"	A-6									
	"	4	"	"	"	7.0 - 8.0	"	"									
166	"	1	577 + 00	12 R	981.4	0.5 - 1.0	Sandy clay loam	A-2-6									
	"	2	"	"	"	1.0 - 2.0	Clay	A-7-6									
	"	3	"	"	"	2.0 - 6.0	"	A-6									

APPENDIX A. (CONTINUED)

Boring No.	Project	Sample No.	Station No.	Offset Ft.	Ground Elevation Ft.	Sample Depth Ft.	Soil Description		Blow per Ft.	RQD %	Grain Size Distribution				LL	PL	PI
							Texture	AASHTO			Gravel	Sand	Silt	Clay			
167	S.R. 27	1	579 + 00	12 R	983.4	0.4 - 2.0	Sandy clay loam	A-2-6									
	"	2	"	"	"	2.0 - 9.0	Clay	A-6									
168	"	1	580 + 00	12 L	983.2	0.2 - 2.0	Sandy clay loam	A-2-6(2)			-	70	5	25	39	21	18
	"	2	"	"	"	2.0 - 3.0	Clay	A-7-6									
	"	3	"	"	"	3.0 - 6.0	"	A-6									
	"	4	"	"	"	6.0 - 8.0	"	"									
169	"	1	583 + 00	12 R	984.6	0.5 - 1.0	Sandy clay loam	A-2-6									
	"	2	"	"	"	1.0 - 4.0	Clay	A-7-6									
	"	3	"	"	"	4.0 - 6.0	"	"									
	"	4	"	"	"	6.0 - 8.0	Sandy clay loam	A-2-6(0)			-	66	15	19	28	16	12
	"	5	"	"	"	8.0 - 9.0	Clay	A-7-6									
170	"	1	586 + 00	12 L	983.2	0.2 - 2.0	Sandy clay loam	A-2-6									
	"	2	"	"	"	2.0 - 6.0	Clay	A-7-6									
	"	3	"	"	"	6.0 - 8.0	"	"									
171	"	1	589 + 00	12 R	980.9	0.5 - 3.0	Sandy clay loam	A-2-6									
	"	2	"	"	"	3.0 - 6.0	Clay	A-7-6									
172	"	1	592 + 00	11 L	977.8	0.3 - 2.0	Sandy clay loam	A-2-6									
	"	2	"	"	"	2.0 - 8.0	Clay	A-7-6									
173	"	1	595 + 00	14 R	974.6	0.3 - 1.0	Sandy clay loam	A-2-6									
	"	2	"	"	"	1.0 - 6.0	Clay	A-7-6									
174	"	1	598 + 00	10 L	970.1	0.2 - 2.0	Sandy clay loam	A-2-6									
	"	2	"	"	"	2.0 - 4.0	Clay	A-7-6									
	"	3	"	"	"	4.0 - 8.0	"	"									
175	"	1	601 + 00	14 R	966.2	0.2 - 1.0	Sandy clay loam	A-2-6									
	"	2	"	"	"	1.0 - 6.0	Clay	A-7-6									
176	"	1	604 + 00	8 L	962.8	0.2 - 3.0	Sandy clay loam	A-2-6									
	"	2	"	"	"	3.0 - 5.0	Clay	A-7-6									
	"	3	"	"	"	5.0 - 8.0	"	"									

APPENDIX A. (CONTINUED)

Boring No.	Project	Sample No.	Station No.	Offset Ft.	Ground Elevation Ft.	Sample Depth Ft.	Soil Description: Texture	Soil Description: AASHTO	Blow per Ft.	RQD %	Grain Size Distribution: Gravel	Sand	Silt	Clay	LL	PL	PI
177	S.R. 27	1	607 + 00	16 L	959.6	0.2 - 2.0	Sandy clay loam	A-2-6									
	"	2	"	"	"	2.0 - 4.0	Clay	A-7-6									
	"	3	"	"	"	4.0 - 6.0	Sandy loam	A-2-6									
178	"	1	610 + 00	8 L	958.2	0.2 - 3.0	Sandy clay loam	A-2-6									
	"	2	"	"	"	3.0 - 5.0	Clay	A-7-6									
	"	3	"	"	"	5.0 - 8.0	"	"									
179	"	1	611 + 50	23 L	954.4	1.0 - 2.0	Clay	A-7-6									
	"	2	"	"	"	2.0 - 5.0	"	A-7-6									
180	"	1	613 + 00	16 R	959.1	0.2 - 3.0	Sandy clay loam	A-2-6									
	"	2	"	"	"	3.0 - 8.0	Clay	A-7-6									
181	"	1	616 + 00	8 L	963.1	0.2 - 2.0	Sandy clay loam	A-2-6									
	"	2	"	"	"	2.0 - 3.0	Clay	A-7-6									
	"	3	"	"	"	3.0 - 6.0	"	"									
	"	4	"	"	"	6.0 - 8.0	"	"									
182	"	1	619 + 00	15 R	960.0	0.2 - 2.0	Sandy clay loam	A-2-6									
	"	2	"	"	"	2.0 - 8.0	Clay	A-7-6									
183	"	1	622 + 00	10 L	957.9	0.2 - 3.0	Sandy clay loam	A-2-6									
	"	2	"	"	"	2.0 - 8.0	Clay	A-7-6(18)			-	36	0	64	62	26	36
184	"	1	622 + 00	25 L	956.1	1.0 - 2.0	Clay	A-7-6									
	"	2	"	"	"	3.5 - 4.5	Sandy clay loam	A-2-6									
185	"	1	624 + 45	30 R	956.0	0.0 - 2.0	Clay	A-7-6									
	"	2	"	"	"	4.0 - 5.0	Clay	A-7-6(17)			-	38	7	55	57	24	33
186	"	1	624 + 60	14 R	957.7	0.5 - 4.0	Sandy clay loam	A-2-6									
	"	2	"	"	"	4.0 - 6.0	Clay	A-7-6									
	"	3	"	"	"	6.0 - 8.0	"	"									
187	"	1	628 + 00	10 L	959.2	0.2 - 2.0	Sandy clay loam	A-2-6									
	"	2	"	"	"	2.0 - 4.0	Clay	A-7-6									
	"	3	"	"	"	4.0 - 8.0	"	A-7-6(12)			-	37	29	34	42	18	24

APPENDIX A. (CONTINUED)

Boring No.	Project	Sample No.	Station No.	Offset Ft.	Ground Elevation Ft.	Sample Depth Ft.	Soil Description: Texture	Soil Description: AASHTO	Blow per Ft.	RQD %	Grain Size Distribution: Gravel	Sand	Silt	Clay	LL	PL	PI
188	S.R. 27	1	632 + 00	13 R	956.4	0.2 - 3.0	Clay	A-7-6(16)			-	13	47	18	54	25	29
	"	2	"	"	"	3.0 - 7.0	"	A-7-6									
189	"	1	632 + 00	30 R	954.6	1.0 - 2.0	Clay	A-7-6									
	"	2	"	"	"	4.0 - 5.0	Sandy clay loam	A-2-6									
190	"	1	634 + 00	12 L	956.0	0.2 - 2.0	Sandy clay loam	A-2-6(2)			-	71	3	26	39	20	19
	"	2	"	"	"	2.0 - 6.0	Clay	A-7-6									
191	"	1	637 + 00	12 R	954.5	0.2 - 4.0	Clay	A-7-6									
	"	2	"	"	"	4.0 - 6.0	"	A-7-6(18)			-	34	19	47	64	23	41
192	"	1	640 + 00	12 L	952.0	0.2 - 1.0	Clay	A-6									
	"	2	"	"	"	1.0 - 3.0	"	A-7-6									
	"	3	"	"	"	3.0 - 8.0	"	A-6									
193	"	1	643 + 00	12 R	950.4	0.2 - 5.0	Sandy loam	"									
	"	2	"	"	"	5.0 - 6.0	Clay	A-6									
194	"	1	646 + 00	12 L	949.2	0.2 - 3.0	Clay	A-7-6									
	"	2	"	"	"	3.0 - 6.0	"	A-6									
	"	3	"	"	"	6.0 - 9.0	"	A-7-6									
195	"	1	649 + 00	12 R	950 0	0.2 - 1.0	Clay	A-7-6									
	"	2	"	"	"	1.0 - 4.0	Sandy loam	A-6									
	"	3	"	"	"	4.0 - 5.0	Clay	"									
	"	4	"	"	"	5.0 - 6.0	"	A-7-6									
196	"	1	652 + 00	12 L	948.5	0.2 - 2.0	Clay	A-7-6									
	"	2	"	"	"	2.0 - 7.0	"	A-6									
	"	3	"	"	"	7.0 - 8.0	Sandy loam	A-6(3)			-	56	26	18	34	19	15
197	"	1	656 + 00	12 R	946.0	0.2 - 4.0	Clay	A-7-6									
	"	2	"	"	"	4.0 - 6.0	"	A-6									
198	"	1	658 + 00	12 L	947.0	0.2 - 2.0	Sandy loam	A-6									
	"	2	"	"	"	2.0 - 6.0	Clay	"									
	"	3	"	"	"	6.0 - 8.0	"	A-7-6									

APPENDIX A. (CONTINUED)

Boring No.	Project	Sample No.	Station No.	Offset Ft.	Ground Elevation Ft.	Sample Depth Ft.	Soil Description		Blow per Ft.	RQD %	Grain Size Distribution				LL	PL	PI
							Texture	AASHTO			Gravel	Sand	Silt	Clay			
199	S.R. 27	1	661 + 00	12 R	943.8	0.2 - 3.0	Clay	A-7-6									
	"	2	"	"	"	3.0 - 5.0	"	A-6									
	"	3	"	"	"	5.0 - 6.0	"	"									
200	"	1	664 + 00	12 L	941.0	0.2 - 3.0	Clay	A-7-6									
	"	2	"	"	"	3.0 - 4.0	"	A-6									
	"	3	"	"	"	4.0 - 8.0	"	A-7-6									
201	"	1	667 + 00	15 R	940.5	0.2 - 2.0	Sandy loam	A-6									
	"	2	"	"	"	2.0 - 4.0	Clay	A-7-6									
	"	3	"	"	"	4.0 - 6.0	"	A-6									
	"	4	"	"	"	6.0 - 8.0	"	"									
202	"	1	670 + 00	12 L	939.2	0.3 - 2.0	Sandy loam	A-6									
	"	2	"	"	"	2.0 - 6.0	Clay	"									
	"	3	"	"	"	6.0 - 8.0	"	A-7-6									
203	"	1	673 + 00	12 R	940.2	0.3 - 4.0	Clay	A-7-6									
	"	2	"	"	"	4.0 - 6.0	"	"									
204	"	1	676 + 00	12 L	937.4	0.3 - 2.0	Sandy loam	A-6									
	"	2	"	"	"	2.0 - 4.0	Clay	A-6(13)			-	28	32	40	40	18	22
	"	3	"	"	"	4.0 - 5.0	"	A-6									
	"	4	"	"	"	5.0 - 8.0	"	A-7-6									
205	"	1	679 + 00	12 R	942 0	0.3 - 6.0	Clay	A-7-6									
206	"	1	683 + 00	12 L	938.0	0.2 - 2.0	Clay	A-7-6									
	"	2	"	"	"	2.0 - 8.0	"	A-6									
207	"	1	685 + 00	12 R	937.0	0.2 - 3.0	Clay	A-7-6									
	"	2	"	"	"	3.0 - 8.0	"	A-6									
208	"	1	688 + 00	12 L	939.2	0.2 - 2.0	Clay	A-7-6									
	"	2	"	"	"	2.0 - 4.0	"	"									
	"	3	"	"	"	4.0 - 8.0	"	"									

APPENDIX A. (CONTINUED)

Boring No.	Project	Sample No.	Station No.	Offset Ft.	Ground Elevation Ft.	Sample Depth Ft.	Soil Description: Texture	Soil Description: AASHTO	Blow per Ft.	RQD %	Grain Size Distribution: Gravel	Sand	Silt	Clay	LL	PL	PI
209	S.R. 27	1	691 + 00	12 R	939.6	0.2 - 2.0	Clay	A-7-6									
	"	2	"	"	"	2.0 - 4.0	"	"									
	"	3	"	"	"	4.0 - 8.0	"	"									
210	"	1	694 + 00	12 L	936.0	0.2 - 2.0	Clay	A-7-6									
	"	2	"	"	"	2.0 - 8.0	"	"									
211	"	1	696 + 75	12 R	935.3	0.3 - 2.0	Clay	A-7-6									
	"	2	"	"	"	2.0 - 4.0	"	"									
	"	3	"	"	"	4.0 - 6.0	"	"									
212	"	1	700 + 00	12 L	937.4	0.2 - 2.0	Sandy clay loam	A-6									
	"	2	"	"	"	2.0 - 6.0	Clay	A-7-6									
	"	3	"	"	"	4.0 - 9.0	"	"									
213	"	1	703 + 00	12 R	941.2	1.0 - 2.0	Clay	A-7-6									
	"	2	"	"	"	2.0 - 4.0	"	"									
	"	3	"	"	"	4.0 - 6.0	"	"									
	"	4	"	"	"	6.0 - 8.0	"	"			-	25	18	57	42	19	23
	"	5	"	"	"	8.0 - 10.0	"	A-7-6(13)									
214	"	1	706 + 00	12 L	941.0	0.2 - 8.0	Clay	A-7-6									
215	"	1	709 + 00	12 R	937.6	0.2 - 2.0	Clay	A-6									
	"	2	"	"	"	2.0 - 4.0	"	"									
	"	3	"	"	"	4.0 - 6.0	"	A-7-6									
216	"	1	712 + 00	12 L	936.0	0.2 - 2.0	Clay	A-7-6									
	"	2	"	"	"	2.0 - 4.0	"	"									
	"	3	"	"	"	4.0 - 8.0	"	"									
217	"	1	715 + 00	12 R	934.9	0.2 - 4.5	Clay	A-6									
	"	2	"	"	"	4.5 - 6.0	"	A-7-6(19)			-	31	31	38	63	22	41
218	"	1	718 + 00	12 L	934.6	0.2 - 2.0	Clay	A-7-6									
	"	2	"	"	"	2.0 - 8.0	"	A-6									

APPENDIX A. (CONTINUED)

Boring No.	Project	Sample No.	Station No.	Offset Ft.	Ground Elevation Ft.	Sample Depth Ft.	Soil Description: Texture	Soil Description: AASHTO	Blow per Ft.	RQD %	Grain Size Distribution: Gravel	Sand	Silt	Clay	LL	PL	PI
219	S.R. 27	1	721 + 00	12 L	933.6	0.2 - 2.0	Clay	A-7-6									
	"	2	"	"	"	2.0 - 4.0	"	A-6									
	"	3	"	"	"	4.0 - 6.0	"	A-7-6									
220	"	1	723 + 00	12 R	931.6	0.2 - 1.0	Clay	A-7-6									
	"	2	"	"	"	1.0 - 4.0	"	A-6									
	"	3	"	"	"	4.0 - 6.0	"	A-7-6									
221	"	1	725 + 00	35 L	927.5	1.0 - 2.0	Clay	A-7-6									
	"	2	"	"	"	4.0 - 5.0	"	A-7-6(20)			-	21	31	48	63	23	40
222	"	1	726 + 00	12 L	930.2	0.2 - 1.0	Clay	A-7-6									
	"	2	"	"	"	1.0 - 4.0	Sandy clay loam	A-6(2)			-	58	20	22	25	14	11
	"	3	"	"	"	4.0 - 5.0	Clay	A-6									
	"	4	"	"	"	5.0 - 6.0	Sandy clay	"									
223	"	1	728 + 00	12 L	930.4	0.2 - 1.0	Clay	A-7-6									
	"	2	"	"	"	1.0 - 2.0	Sandy clay loam	A-6									
	"	3	"	"	"	2.0 - 4.0	"	"									
	"	4	"	"	"	4.0 - 6.0	"	"									
224	"	1	732 + 00	12 R	930.5	1.0 - 2.0	Sandy clay loam	A-6									
	"	2	"	"	"	2.0 - 4.0	"	"									
	"	3	"	"	"	4.0 - 6.0	"	A-7-6									
225	"	1	735 + 75	12 L	925.9	0.2 - 1.0	Clay	A-7-6									
	"	2	"	"	"	1.0 - 6.0	Sandy clay loam	A-6									
226	"	1	741 + 00	12 R	921.8	0.2 - 2.0	Clay	A-7-6									
	"	2	"	"	"	2.0 - 4.0	Sandy clay loam	A-6									
	"	3	"	"	"	4.0 - 5.0	Clay	A-7-6									
	"	4	"	"	"	5.0 - 6.0	Sandy clay loam	A-6									
227	"	1	744 + 00	12 L	913.0	0.2 - 2.5	Clay	A-7-6									
	"	2	"	"	"	2.5 - 4.0	Sandy clay loam	A-6									
	"	3	"	"	"	4.0 - 6.0	"	"									

APPENDIX A. (CONTINUED)

Boring No.	Project	Sample No.	Station No.	Offset Ft.	Ground Elevation Ft.	Sample Depth Ft.	Soil Description		Blow per Ft.	RQD %	Grain Size Distribution				LL	PL	PI
							Texture	AASHTO			Gravel	Sand	Silt	Clay			
228	S.R. 27	1	747 + 00	12 R	909.4	1.0 - 3.5	Clay	A-7-6									
	"	2	"	"	"	3.5 - 6.0	"	A-6(10)			-	32	37	31	39	22	17
	"	3	"	"	"	6.0 - 9.0	"	A-6									
	"	4	"	"	"	9.0 - 11.0	"	A-7-6									
	"	5	"	"	"	11.0 - 14.0	"	"									
	"	6	"	"	"	18.0 - 20.0	Sandy loam	A-2-6(0)			-	71	16	13	31	20	11
229	"	1	747 + 00	29 R	903.9	0.0 - 1.0	Clay	A-7-6(14)			-	21	44	35	49	28	21
	"	2	"	"	"	4.0 - 5.0	"	A-7-6									
230	"	1	747 + 50	12 R	909.7	5.0 - 6.5	Clay	A-7-6	13								
	"	2	"	"	"	10.0 - 10.5	"	"	6								
	"	3	"	"	"	10.5 - 11.5	"	A-6	6								
	"	4	"	"	"	15.0 - 16.5	Sandy loam	A-2-6	29								
	"	5	"	"	"	20.0 - 21.5	Clay	A-6	29								
231	"	1	748 + 00	280 R	907.5	4.0 - 5.0	Sandy clay loam	A-6									
	"	2	"	"	"	8.0 - 9.5	Sandy loam	A-2-6									
	"	3	"	"	"	9.5 - 10.5	Sandy clay loam	A-6									
232	"	1	750 + 00	12 L	908.8	0.0 - 6.0	Clay	A-7-6									
	"	2	"	"	"	6.0 - 10.0	Sandy loam	A-2-6									
233	"	1	753 + 00	12 R	907.6	1.0 - 4.0	Clay	A-6									
	"	2	"	"	"	4.0 - 7.0	"	A-7-6									
	"	3	"	"	"	7.0 - 10.0	"	"									
234	"	1	756 + 00	12 L	909.9	4.0 - 7.0	Clay	A-6									
235	"	1	759 + 00	12 R	915.2	1.0 - 2.0	Clay	A-7-6									
	"	2	"	"	"	2.0 - 5.0	"	"									
	"	3	"	"	"	5.0 - 7.0	"	"									

APPENDIX A. (CONTINUED)

Boring No.	Project	Sample No.	Station No.	Offset Ft.	Ground Elevation Ft.	Sample Depth Ft.	Soil Description: Texture	Soil Description: AASHTO	Blow per Ft.	RQD %	Grain Size Distribution: Gravel	Sand	Silt	Clay	LL	PL	PI
236	S.R. 27 over	1	748 + 09	6 R	907.8	3.5 - 5.0	Sandy clay		3								
	Little	2	"	"	"	8.5 - 10.0	Sand & gravel		8								
	Salamonie	3	"	"	"	13.5 - 15.0	"		10								
	River	4	"	"	"	18.5 - 20.0	"		21								
	"	5	"	"	"	20.0 - 23.5	Clayey silt		22								
	"	6	"	"	"	23.5 - 25.0	Silty clay & gravel		67								
	"	7	"	"	"	28.5 - 30.0	"		31								
237	"	1	748 + 41	7 R	908.0	3.5 - 5.0	Sandy clay		3								
	"	2	"	"	"	8.5 - 10.0	Sand & gravel		9								
	"	3	"	"	"	13.5 - 15.0	"		14								
	"	4	"	"	"	15.0 - 17.5	Silty clay		10								
	"	5	"	"	"	18.5 - 21.0	"		17								
	"	6	"	"	"	23.5 - 26.0	Sandy silt		30								
	"	7	"	"	"	28.5 - 31.0	Clayey silt		32								
	"	8	"	"	"	31.5 - 34.0	"		47								
	"	9	"	"	"	35.0 - 37.5	"		43								
	"	10	"	"	"	38.5 - 41.0	"		92								
	"	11	"	"	"	42.0 - 45.0	"		50/.5								
	"	12	"	"	"	48.5 - 50.0	"		90								
238	"	1	749 + 08	6 L	908.0	3.5 - 6.0	Sandy clay		6								
	"	2	"	"	"	7.5 - 10.0	"		5								
	"	3	"	"	"	11.0 - 13.5	Sand & gravel		7								
	"	4	"	"	"	16.0 - 18.5	"		9								
	"	5	"	"	"	18.5 - 21.0	Sandy clay		14								
	"	6	"	"	"	23.5 - 26.0	"		18								
	"	7	"	"	"	28.5 - 30.0	Silty sand		31								
239	"	1	749 + 34	8 L	907.8	3.5 - 6.0	Clayey silt		13								
	"	2	"	"	"	8.5 - 11.0	Sand & gravel		7								
	"	3	"	"	"	12.5 - 15.0	"		11								
	"	4	"	"	"	15.0 - 17.5	"		20								
	"	5	"	"	"	18.5 - 21.0	Silty clay		14								
	"	6	"	"	"	25.0 - 27.5	"		20								
	"	7	"	"	"	28.5 - 31.0	Sandy silt		57								
	"	8	"	"	"	32.5 - 35.0	"		39								
	"	9	"	"	"	36.0 - 38.0	Clayey silt		42								
	"	10	"	"	"	38.0 - 40.0	"		28								

APPENDIX B

PHYSICAL AND CHEMICAL PROPERTIES OF AGRICULTURAL SOILS IN JAY COUNTY

APPENDIX B. PHYSICAL AND CHEMICAL PROPERTIES OF AGRICULTURAL SOILS IN JAY COUNTY (1)

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	g/cm³	In/hr	In/in	pH					Pct
BlA											
Blount	0-9	22-27	1.35-1.55	0.6-2.0	0.20-0.24	5.1-7.3	Low	0.43	3	6	2-3
	9-34	35-50	1.40-1.70	0.06-0.6	0.12-0.19	4.5-8.4	Moderate	0.43			
	34-60	27-38	1.60-1.85	0.06-0.6	0.07-0.10	7.4-8.4	Moderate	0.43			
Glynwood	0-9	27-38	1.35-1.55	0.2-0.6	0.17-0.22	5.6-7.3	Low	0.43	2	6	1-2
	9-20	35-55	1.45-1.75	0.06-0.2	0.11-0.18	4.5-7.8	Moderate	0.32			
	20-60	27-36	1.65-1.85	0.06-0.2	0.06-0.10	7.4-8.4	Moderate	0.32			
Bo Bono	0-9	35-45	1.20-1.45	0.2-2.0	0.20-0.23	6.1-7.3	High	0.28	5	4	4-6
	9-49	38-55	1.35-1.55	<0.2	0.10-0.14	6.1-8.4	High	0.28			
	49-80	8-45	1.25-1.50	0.6-2.0	0.10-0.18	7.4-8.4	Moderate	0.28			
Bs Bono Variant	0-10	40-60	0.85-1.40	0.2-6.0	0.20-0.25	5.1-6.0	Low	0.28	5	2	20-30
	10-33	38-60	1.35-1.55	<0.06	0.11-0.18	6.1-7.8	Moderate	0.28			
	33-60	40-60	1.45-1.60	<0.06	0.10-0.12	7.4-8.4	Moderate	0.28			
Ee Eel	0-9	27-32	1.35-1.55	0.6-2.0	0.21-0.23	6.1-7.3	Low	0.37	5	6	1-2
	9-40	18-32	1.30-1.50	0.6-2.0	0.17-0.22	5.6-7.8	Low	0.37			
	40-60	10-27	1.30-1.50	0.6-2.0	0.19-0.21	6.1-8.4	Low	0.37			
Ef Eel Variant	0-11	35-45	1.45-1.55	0.6-2.0	0.12-0.19	6.1-7.3	Low	0.32	5	4	2-4
	11-60	35-45	1.45-1.60	0.2-0.6	0.09-0.19	4.5-7.3	Moderate	0.32			
ElA Eldean	0-11	15-25	1.30-1.50	0.6-2.0	0.18-0.22	5.6-7.3	Low	0.37	4	5	2-3
	11-33	35-48	1.40-1.60	0.2-2.0	0.08-0.14	5.6-7.8	Moderate	0.37			
	33-60	2-8	---	>6.0	0.01-0.04	7.4-8.4	Low	0.10			
EnB3, EnC3 Eldean	0-8	27-33	1.35-1.55	0.6-2.0	0.16-0.18	5.6-7.3	Low	0.37	3	6	2-3
	8-32	35-48	1.40-1.60	0.2-2.0	0.08-0.14	5.6-7.8	Moderate	0.37			
	32-60	2-8	---	>6.0	0.01-0.04	7.4-8.4	Low	0.10			
GsB3, GsC3 Glynwood	0-9	27-38	1.35-1.55	0.2-0.6	0.17-0.22	5.6-7.3	Low	0.43	2	6	1-2
	9-20	35-55	1.45-1.75	0.06-0.2	0.11-0.18	4.5-7.8	Moderate	0.32			
	20-60	27-36	1.65-1.85	0.06-0.2	0.06-0.10	7.4-8.4	Moderate	0.32			
Ho Houghton	0-60	---	0.15-0.45	0.2-6.0	0.35-0.45	5.6-7.8	---	---	2	2	>70
MaA, MaB2 Martinsville	0-9	8-20	1.30-1.45	0.6-2.0	0.20-0.24	5.1-7.3	Low	0.37	5	5	2-3
	9-48	20-33	1.40-1.60	0.6-2.0	0.16-0.20	5.1-7.3	Moderate	0.37			
	48-65	8-25	1.25-1.60	0.6-2.0	0.12-0.17	5.1-7.8	Low	0.24			
MoD3 Morley	0-5	27-35	1.40-1.60	0.2-0.6	0.18-0.22	5.1-6.5	Moderate	0.43	2	7	1-3
	5-22	35-50	1.55-1.70	0.2-0.6	0.11-0.15	6.1-7.8	Moderate	0.43			
	22-60	27-40	1.60-1.80	0.06-0.6	0.07-0.12	6.1-8.4	Moderate	0.43			
Pm Pewamo	0-10	40-45	1.35-1.55	0.2-0.6	0.12-0.20	6.1-7.3	Moderate	0.24	5	4	3-5
	10-28	35-50	1.40-1.70	0.2-0.6	0.12-0.20	5.6-7.8	Moderate	0.24			
	28-60	30-40	1.50-1.75	0.2-0.6	0.14-0.18	7.4-8.4	Moderate	0.24			
So Saranac	0-12	40-50	0.90-1.50	0.06-0.2	0.12-0.20	6.1-7.3	Moderate	0.24	5	4	4-6
	12-46	27-60	1.30-1.80	0.06-0.6	0.10-0.20	6.1-7.3	Moderate	0.24			
	46-60	10-35	1.40-1.95	0.06-0.6	0.10-0.20	6.1-7.3	Low	0.24			
St Saranac	0-10	40-60	0.90-1.50	0.06-0.2	0.12-0.20	6.1-7.8	Moderate	0.24	5	4	4-6
	10-44	35-60	1.30-1.80	0.2-0.6	0.10-0.20	5.6-7.8	Moderate	0.24			
	44-60	18-45	1.50-1.95	0.06-0.6	0.10-0.20	6.6-8.4	Moderate	0.24			
Wa Wallkill Variant	0-8	40-60	1.20-1.45	0.06-0.2	0.10-0.14	5.6-6.5	High	0.28	5	4	4-6
	8-17	38-60	1.35-1.55	0.06-0.2	0.08-0.12	5.1-6.5	High	0.28			
	17-36	---	---	0.2-6.0	0.35-0.45	5.1-7.3	---	---			
	36-60	---	---	0.06-0.2	0.18-0.24	6.6-8.4	---	---			
Wh Whitaker	0-13	8-19	1.30-1.45	0.6-2.0	0.20-0.24	5.6-7.3	Low	0.37	5	5	2-3
	13-43	18-30	1.40-1.60	0.6-2.0	0.15-0.19	5.1-7.3	Moderate	0.37			
	43-65	3-18	1.50-1.70	0.6-6.0	0.19-0.21	6.1-8.4	Low	0.37			

APPENDIX C

ENGINEERING INDEX PROPERTIES OF AGRICULTURAL SOILS IN JAY COUNTY

APPENDIX C. ENGINEERING INDEX PROPERTIES OF AGRICULTURAL SOILS IN JAY COUNTY (1)

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
B1A Blount----------	0-9	Silt loam--------	CL	A-6, A-4	0-5	95-100	95-100	90-100	80-95	25-40	8-20
	9-34	Silty clay loam, clay, clay loam.	CH, CL	A-7, A-6	0-5	95-100	90-100	80-90	75-85	35-60	15-35
	34-60	Silty clay loam, clay loam.	CL	A-6, A-7	0-10	90-100	90-100	80-100	70-90	30-45	10-25
Glynwood--------	0-9	Clay loam--------	CL	A-6, A-7	0-2	95-100	85-100	75-100	60-95	30-45	11-19
	9-20	Clay, clay loam	CL, CH	A-6, A-7	0-5	95-100	85-100	75-100	65-95	35-55	14-30
	20-60	Clay loam, silty clay loam.	CL	A-4, A-6	0-5	95-100	80-100	75-95	65-90	25-40	6-15
Bo--------------- Bono	0-9	Silty clay--------	CH, CL	A-7	0	100	98-100	95-100	80-95	40-60	20-35
	9-49	Silty clay, clay, silty clay loam.	CH, CL	A-7	0	100	98-100	95-100	90-100	40-66	26-44
	49-80	Stratified silty clay to coarse sand.	CH, CL, CL-ML, SM	A-7, A-6, A-2	0	100	95-100	70-95	30-80	<35	NP-15
Bs--------------- Bono Variant	0-10	Mucky silty clay	CL, CH, MH	A-7	0	100	100	95-100	90-95	40-65	15-30
	10-33	Silty clay loam, silty clay.	CL, CH, MH	A-7	0	100	100	95-100	85-95	40-65	15-30
	33-60	Silty clay, silty clay loam.	CL, CH, MH	A-7	0	100	100	95-100	90-95	40-65	15-30
Ee--------------- Eel	0-9	Clay loam--------	CL	A-6	0	100	100	95-100	80-90	30-40	10-16
	9-40	Silt loam, loam, clay loam.	ML, CL, CL-ML	A-4, A-6	0	100	100	90-100	75-85	24-40	3-15
	40-60	Stratified sandy loam to silty clay loam.	ML, CL, CL-ML	A-4, A-6	0	100	90-100	70-80	55-70	24-40	3-15
Ef--------------- Eel Variant	0-11	Silty clay--------	CL	A-7, A-6	0	100	100	90-100	70-95	35-50	15-25
	11-60	Silty clay, silty clay loam.	CL	A-7, A-6	0	100	100	90-100	70-95	35-50	15-25
ElA-------------- Eldean	0-11	Silt loam--------	ML, CL-ML, CL	A-4, A-6	0	85-100	80-100	70-100	55-90	20-40	4-14
	11-33	Clay, gravelly sandy clay, gravelly clay loam.	CL, ML	A-7, A-6	0-5	75-100	60-100	55-95	50-80	35-50	12-23
	33-60	Stratified sand to gravel.	GM, SM, GP-GM, SP-SM	A-1, A-2	0-15	30-70	20-50	5-40	0-35	---	NP
EnB3, EnC3------- Eldean	0-8	Clay loam--------	CL	A-6, A-4	0-5	85-100	75-100	65-100	55-80	25-40	9-15
	8-32	Clay, gravelly sandy clay, gravelly clay loam.	CL, ML	A-7, A-6	0-5	75-100	60-100	55-95	50-80	35-50	12-23
	32-60	Stratified sand to gravel.	GM, SM, GP-GM, SP-SM	A-1, A-2	0-15	30-70	20-50	5-40	0-35	---	NP
GsB3, GsC3------- Glynwood	0-9	Clay loam--------	CL	A-6, A-7	0-2	95-100	85-100	75-100	60-95	30-45	11-19
	9-20	Clay, clay loam	CL, CH	A-6, A-7	0-5	95-100	85-100	75-100	65-95	35-55	14-30
	20-60	Clay loam, silty clay loam.	CL	A-4, A-6	0-5	95-100	80-100	75-95	65-90	25-40	6-16
Ho--------------- Houghton	0-60	Sapric material	PT	A-8	0	---	---	---	---	---	---

APPENDIX C. (CONTINUED)

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
MaA, MaB2---------Martinsville	0-9	Loam---------------	CL, CL-ML, ML	A-4	0	100	85-100	75-100	65-90	<25	3-8
	9-48	Clay loam, sandy loam, sandy clay loam.	CL, SC	A-4, A-6, A-2	0	95-100	85-100	70-100	30-95	25-40	7-15
	48-65	Stratified silt loam to loamy coarse sand.	SM, CL-ML, CL, SC	A-2, A-4, A-6	0	95-100	85-100	55-95	30-75	20-30	NP-11
MoD3---------------Morley	0-5	Clay loam----------	CL	A-6, A-7	0-5	95-100	90-100	85-95	80-90	30-45	15-25
	5-22	Silty clay, clay loam, clay.	CL, CH	A-7	0-10	95-100	90-100	85-95	80-90	40-60	15-35
	22-60	Silty clay loam, clay loam.	CL	A-6, A-7	0-10	95-100	90-100	85-95	80-90	30-60	15-30
Pm----------------Pewamo	0-10	Silty clay--------	CH	A-7	0-5	90-100	80-100	80-100	75-95	50-55	25-30
	10-28	Clay loam, clay, silty clay.	CL, CH	A-7, A-6	0-5	95-100	90-100	90-100	75-95	35-55	15-30
	28-60	Clay loam, silty clay loam.	CL	A-7	0-5	95-100	90-100	90-100	70-90	40-50	15-25
So----------------Saranac	0-12	Clay--------------	CL, CH, ML, MH	A-7	0	100	95-100	90-100	80-95	40-55	15-25
	12-46	Clay, clay loam	CL, CH	A-6, A-7	0	100	95-100	90-100	70-90	30-60	10-30
	46-60	Gravelly loam-----	CL-ML, ML	A-4	0	100	85-100	75-90	65-85	15-40	3-20
St----------------Saranac	0-10	Clay--------------	CL, CH	A-7	0	100	100	95-100	80-95	40-55	20-35
	10-44	Clay loam, silty clay loam, clay.	CL, CH	A-7	0	100	95-100	90-100	70-90	40-60	20-35
	44-60	Stratified silty clay loam to sandy loam.	CL, CH, SM-SC	A-7, A-6, A-4	0	100	95-100	90-100	70-90	40-60	20-35
Wa----------------Wallkill Variant	0-8	Silty clay--------	CH, CL	A-7	0	100	100	90-100	75-95	40-65	20-40
	8-17	Silty clay, silty clay loam.	CH, CL	A-7	0	100	100	90-100	75-95	40-65	20-40
	17-36	Sapric material	PT	A-8	0	---	---	---	---	---	---
	36-60	Coprogenous earth	OH, OL	A-8	0	---	---	---	---	---	---
Wh----------------Whitaker	0-13	Silt loam---------	CL, CL-ML, ML	A-4, A-6	0	100	95-100	80-100	60-90	15-35	2-15
	13-43	Clay loam, loam, sandy clay loam.	CL, CL-ML	A-6, A-4	0	100	95-100	90-100	70-80	20-35	5-15
	43-65	Stratified coarse sand to silt loam.	ML, SM, CL-ML, SM-SC	A-4	0	98-100	98-100	60-85	40-60	<25	NP-7

APPENDIX D

STATISTICAL STREAM FLOW DATA FOR SELECTED STREAMS IN JAY COUNTY

APPENDIX D-1. STATISTICAL STREAM FLOW DATA FOR SALAMONIE RIVER (43)

03324200 SALAMONIE RIVER AT PORTLAND, IN

LOCATION.--Lat 40°25'40", long 85°02'20", in NE¼SE¼ sec.23, T.23 N., R.13 E., Jay County, Hydrologic Unit 05120102, on right bank at downstream side of county road bridge, 2.3 mi downstream from Butternut Creek, 3.2 mi west of Portland, 3.7 mi downstream from Little Salamonie River, and at mile 70.5.

DRAINAGE AREA.--85.6 mi².

PERIOD OF RECORD.--September 1959 to September 1985.

GAGE.--Water-stage recorder. Datum of gage is 877.59 ft above National Geodetic Vertical Datum of 1929 (levels by State of Indiana, Department of Natural Resources). Prior to Oct. 1, 1960, nonrecording gage at site 1.4 mi upstream at datum 6.43 ft higher.

REMARKS.--Natural flow partially affected by sewage effluent.

AVERAGE DISCHARGE.--26 years, 73.1 ft³/s, 11.60 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,460 ft³/s Mar. 5, 1963, gage height, 16.96 ft; minimum daily, 0.4 ft³/s Sept. 27, 1965.

DURATION TABLE OF DAILY MEAN DISCHARGES FOR YEAR ENDING SEPTEMBER 30

NUMBER OF DAYS IN CLASS

CLASS / YEAR	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
1960				1		6	8	26	19	26	11	41	30	36	37	21	16	9	11	13	12	15	4	4	4	4	1	2	4	2	3				
1961				1	5	15	60	25	20	8	18	26	25	18	20	17	12	9	7	7	11	7	6	6	7	8	3	5	7	6	5	1			
1962						1	15	8	40	38	18	19	24	27	37	19	23	18	13	16	4	7	7	3	6	1	3	4	2	6	2	2	2		
1963					1		7	38	54	39	40	25	17	21	22	15	10	17	6	11	11	5	4	6	3	2	2	2	4	1		1			1
1964				3	7	11	33	100	39	32	21	19	12	5	8	6	4	10	12	7	7	1	5	2	2	1	5	4	3	1		2	3	1	
1965		3	1	9	14	24	79	57	27	11	14	11	11	10	12	7	6	7	8	7	7	8	4	7		5	5	1	4	3		1	2		
1966			1	2	9	20	34	53	40	24	22	29	20	8	17	13	15	8	13	5	10	7	2	8			3	1	1						
1967					3	6	11	35	35	26	23	22	9	15	20	18	17	16	18	14	12	17	7	8	4	3	7	4	3	5	3	2	1	1	
1968					2	5	10	17	24	27	18	22	66	20	19	17	12	18	7	14	9	11	8	5	5	5	3	6	5	4	2	2	3		
1969						1	9	23	17	21	25	30	25	19	34	30	20	20	18	12	16	12	2	5	8	4	3	2	2	1	3	1	2		
1970					2	10	14	21	21	29	31	30	20	18	28	16	14	16	13	16	14	13	6	12		4	2	2	7	2	2	1		1	
1971			3	4	3	18	32	39	17	39	19	23	23	22	26	13	11	10	13	7	8	7	5	5	4	4	2		4	1	2	1			
1972							3	10	16	38	35	24	12	17	19	18	22	31	21	17	12	14	10	5	9	6	5	5	6	2	3	4	1	1	
1973				1	1	4	8	23	17	5	10	5	6	9	18	30	27	21	20	31	25	21	20	16	10	8	5	3	4	7	4	2	3	1	
1974						2	8	19	17	45	21	13	22	22	22	21	24	17	17	18	9	11	6	12	14	6	3	2	4	6	2		2		
1975							1	11	21	35	18	23	27	15	27	25	25	12	23	21	14	13	10	8	8	5	7	7	2	3	1	1	2		
1976						3	20	29	23	22	32	31	22	24	27	20	19	14	12	11	7	9	3	7	6	5	5		4	4	2		3		
1977						3	48	69	72	32	12	12	11	18	17	11	10	7	9	5	6	7	4	4	3	2	1		1		1				
1978							3	23	23	27	25	44	35	19	27	20	13	13	6	13	6	13	8	5	5	6	5	3	2	7	1	4	4	1	
1979						1	5	10	16	20	40	25	28	27	32	24	12	18	19	11	10	12	6	12	13	5	5	1	2	6	3	1	1		
1980								4	15	15	16	39	21	29	47	26	24	20	13	14	15	13	10	8	7	7	7	2	4	3	2	2	2	1	
1981						3	9	34	44	30	25	25	28	11	18	12	21	13	11	13	14	15	12	3	3	6	6	3	2		1	1	1	1	
1982				2	7	13	17	15	26	25	23	19	17	10	29	16	19	10	17	13	12	15	5	10	3	8	4	6	11	4	4	3	2		
1983			4	16	15	20	17	33	12	12	12	20	26	17	23	22	23	18	13	12	9	13	2	6	7	5	3	1	1	2		1			
1984						5	5	4	18	37	36	27	13	24	28	12	16	20	21	17	10	14	10	9	11	7	7	4	1	5	4		1		
1985							1	7	62	24	28	29	19	36	37	17	7	21	14	12	8	10	7	7	3	1	4	3	3	1	1	1	1	1	

CLASS	VALUE	TOTAL	ACCUM	PERCT	CLASS	VALUE	TOTAL	ACCUM	PERCT	CLASS	VALUE	TOTAL	ACCUM	PERCT
0	0.00	0	9497	100.00	12	7.8	569	5368	56.52	24	200.0	147	750	7.90
1	0.40	3	9497	100.00	13	10.0	497	4799	50.53	25	260.0	119	603	6.35
2	0.52	9	9494	99.97	14	13.0	651	4302	45.30	26	340.0	106	485	5.11
3	0.69	39	9485	99.87	15	18.0	466	3651	38.44	27	450.0	73	379	3.99
4	0.90	69	9446	99.46	16	23.0	422	3185	33.54	28	580.0	93	306	3.22
5	1.2	171	9377	98.74	17	30.0	393	2763	29.09	29	770.0	82	213	2.24
6	1.5	457	9206	96.94	18	39.0	357	2370	24.96	30	1000.0	51	131	1.38
7	2.0	733	8749	92.12	19	51.0	337	2013	21.20	31	1300.0	34	80	0.84
8	2.7	735	8016	84.41	20	67.0	280	1676	17.65	32	1700.0	36	46	0.48
9	3.5	687	7281	76.67	21	88.0	290	1396	14.70	33	2300.0	9	10	0.11
10	4.5	593	6594	69.43	22	120.0	173	1106	11.65	34	3000.0	1	1	0.01
11	5.9	633	6001	63.19	23	150.0	183	933	9.82					

APPENDIX D-1. (CONTINUED)

LOWEST MEAN DISCHARGE AND RANKING FOR THE FOLLOWING NUMBER OF CONSECUTIVE DAYS IN YEAR ENDING MARCH 31

YEAR	1	3	7	14	30	60	90	120	183
1961	0.80 7	0.90 4	1.30 8	1.50 6	1.60 5	1.90 4	2.00 3	2.00 1	2.50 1
1962	2.80 24	2.90 24	3.20 24	3.60 24	3.80 22	9.70 23	18.00 23	20.00 23	37.00 23
1963	1.40 18	1.60 15	1.60 12	1.90 12	2.20 14	3.50 15	4.40 14	5.50 13	6.50 7
1964	0.70 5	0.97 5	1.30 9	1.60 7	1.80 9	2.00 7	2.10 5	2.10 4	2.60 3
1965	0.80 8	0.97 6	1.19 6	1.60 8	1.70 6	1.90 5	2.00 4	2.00 2	2.50 2
1966	0.40 1	0.47 1	1.00 3	1.30 4	1.50 3	1.70 3	1.80 2	2.10 3	4.20 5
1967	0.60 3	1.00 7	1.19 7	1.70 9	2.10 12	2.10 8	2.80 9	4.30 10	11.00 13
1968	0.90 10	1.00 8	1.50 10	1.90 13	2.00 10	2.50 10	3.30 11	3.90 9	5.90 6
1969	1.50 19	2.10 20	2.80 22	3.00 20	3.20 17	3.80 16	5.80 17	13.00 17	23.00 21
1970	1.30 16	1.70 18	2.00 17	2.10 14	2.10 13	4.90 18	11.00 21	13.00 18	22.00 17
1971	0.85 9	1.00 9	1.10 4	1.40 5	1.70 7	2.00 6	2.20 6	2.50 5	7.30 8
1972	0.55 2	0.63 2	0.73 2	1.10 3	1.60 4	2.90 13	4.80 15	6.10 15	13.00 14
1973	1.80 20	2.10 19	2.20 18	3.10 21	4.00 24	14.00 24	18.00 24	25.00 24	67.00 24
1974	0.72 6	1.10 11	1.70 13	1.80 10	2.00 11	2.60 11	3.60 13	16.00 22	23.00 22
1975	2.10 23	2.20 21	3.00 23	3.20 22	3.30 19	7.80 20	13.00 22	14.00 20	22.00 18
1976	1.19 12	1.60 16	2.50 19	2.70 18	3.50 20	8.30 21	9.50 19	14.00 21	22.00 19
1977	1.30 13	1.50 13	1.70 14	1.80 11	1.80 8	2.20 9	2.40 8	2.80 7	2.80 4
1978	1.30 14	1.50 14	1.70 15	2.20 15	3.20 18	5.10 19	5.70 16	5.80 14	13.00 15
1979	1.30 15	1.70 17	2.00 16	2.20 16	2.90 16	3.20 14	3.50 12	4.70 12	9.90 12
1980	3.00 25	3.10 25	3.50 25	5.50 25	6.80 25	18.00 25	38.00 25	76.00 25	77.00 25
1981	1.40 17	1.40 12	1.60 11	2.20 17	2.60 15	2.80 12	3.00 10	3.60 8	9.50 11
1982	2.00 22	2.30 22	2.60 20	3.00 19	3.80 23	9.30 22	10.00 20	13.00 19	23.00 20
1983	0.64 4	0.65 3	0.70 1	0.82 1	0.89 1	1.10 1	1.60 1	2.50 6	8.70 10
1984	1.00 11	1.00 10	1.10 5	1.10 2	1.40 2	1.70 2	2.30 7	4.40 11	8.10 9
1985	1.90 21	2.30 23	2.70 21	3.40 23	3.70 21	4.30 17	6.30 18	8.30 16	17.00 16

HIGHEST MEAN DISCHARGE AND RANKING FOR THE FOLLOWING NUMBER OF CONSECUTIVE DAYS IN YEAR ENDING SEPTEMBER 30

YEAR	1	3	7	15	30	60	90	120	183
1960	1180.00 24	626.00 24	496.00 24	271.00 23	213.00 24	136.00 24	116.00 23	105.00 23	80.00 24
1961	1500.00 22	1010.00 20	701.00 18	595.00 9	406.00 6	358.00 4	264.00 3	209.00 3	158.00 5
1962	2100.00 14	1540.00 8	988.00 5	654.00 4	405.00 7	261.00 10	236.00 6	181.00 10	133.00 14
1963	3140.00 1	1760.00 5	904.00 9	597.00 8	381.00 9	245.00 13	171.00 19	132.00 20	92.00 21
1964	2640.00 3	1980.00 3	973.00 6	574.00 11	439.00 4	362.00 3	246.00 4	188.00 8	126.00 15
1965	1940.00 18	978.00 22	898.00 10	480.00 15	310.00 17	245.00 14	203.00 13	161.00 16	107.00 20
1966	592.00 26	355.00 26	185.00 26	115.00 26	97.00 26	54.00 26	48.00 26	49.00 26	41.00 25
1967	2350.00 10	2000.00 2	1240.00 2	656.00 3	359.00 12	226.00 18	181.00 17	189.00 7	166.00 4
1968	1840.00 19	1110.00 17	907.00 8	485.00 14	322.00 16	234.00 15	197.00 14	172.00 12	143.00 10
1969	1710.00 20	1260.00 15	641.00 21	464.00 17	276.00 21	187.00 21	144.00 21	139.00 19	111.00 19
1970	2470.00 6	1260.00 16	680.00 20	370.00 22	234.00 23	174.00 22	176.00 18	146.00 18	116.00 18
1971	1330.00 23	910.00 23	775.00 15	436.00 20	289.00 20	188.00 20	132.00 22	110.00 22	84.00 22
1972	2480.00 4	1730.00 6	966.00 7	639.00 6	439.00 5	285.00 7	207.00 12	180.00 11	150.00 6
1973	2470.00 5	1280.00 14	777.00 14	651.00 5	378.00 10	290.00 6	222.00 7	181.00 9	201.00 2
1974	2280.00 11	1300.00 13	889.00 11	540.00 12	364.00 11	256.00 12	217.00 8	202.00 5	148.00 8
1975	2030.00 15	1330.00 9	759.00 16	434.00 21	298.00 18	231.00 16	213.00 10	204.00 4	148.00 9
1976	2230.00 12	1320.00 10	842.00 12	577.00 10	454.00 3	300.00 5	237.00 5	194.00 6	134.00 13
1977	1160.00 25	499.00 25	356.00 25	226.00 25	145.00 25	100.00 25	76.00 25	58.00 25	41.00 26
1978	2400.00 8	1880.00 4	1430.00 1	981.00 1	629.00 1	382.00 2	282.00 2	240.00 2	197.00 3
1979	2230.00 13	1320.00 11	714.00 17	538.00 13	296.00 19	212.00 19	146.00 20	176.00 21	137.00 12
1980	2420.00 7	1310.00 12	835.00 13	465.00 16	336.00 14	231.00 17	185.00 15	161.00 17	147.00 11
1981	2350.00 9	1040.00 19	536.00 22	453.00 19	341.00 13	268.00 8	207.00 11	162.00 15	119.00 16
1982	1980.00 16	1580.00 7	1050.00 4	672.00 2	557.00 2	411.00 1	330.00 1	282.00 1	209.00 1
1983	1550.00 21	995.00 21	501.00 23	259.00 24	235.00 22	151.00 23	107.00 24	92.00 24	83.00 23
1984	1950.00 17	1070.00 18	693.00 19	457.00 18	325.00 15	259.00 11	216.00 9	170.00 13	149.00 7
1985	2950.00 2	2170.00 1	1080.00 3	611.00 7	386.00 8	263.00 9	181.00 16	166.00 14	118.00 17

APPENDIX D-1. (CONTINUED)

ANNUAL VALUES

ANNUAL MEAN DISCHARGE AND RANKING IN YEAR ENDING MARCH 31

1961	49.00	7
1962	111.00	22
1963	50.00	8
1964	39.00	3
1965	68.00	12
1966	39.00	4
1967	79.00	16
1968	78.00	15
1969	69.00	13
1970	66.00	11
1971	60.00	9
1972	48.00	6
1973	156.00	25
1974	99.00	21
1975	90.00	20
1976	81.00	17
1977	23.00	1
1978	83.00	18
1979	66.00	10
1980	112.00	23
1981	38.00	2
1982	143.00	24
1983	40.00	5
1984	78.00	14
1985	63.00	19

ANNUAL MEAN DISCHARGE AND RANKING IN YEAR ENDING SEPTEMBER 30

1960	53.00	21
1961	85.00	8
1962	78.00	13
1963	49.00	22
1964	64.00	18
1965	54.00	20
1966	23.00	25
1967	88.00	6
1968	86.00	7
1969	66.00	16
1970	67.00	15
1971	45.00	23
1972	101.00	4
1973	128.00	1
1974	84.00	9
1975	83.00	10
1976	73.00	14
1977	23.00	26
1978	107.00	3
1979	82.00	12
1980	94.00	5
1981	64.00	17
1982	109.00	2
1983	44.00	24
1984	83.00	11
1985	63.00	19

NORMAL MONTHLY MEANS (ALL DAYS)

YEAR	OCT	NOV	DEC	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT
1960	23.00	41.40	83.00	110.00	137.00	77.40	22.70	34.90	16.20	74.40	10.00	2.04
1961	1.97	2.32	2.00	2.16	93.60	327.00	332.00	41.30	44.70	24.10	98.00	49.10
1962	4.34	34.00	15.80	391.00	111.00	191.00	14.90	39.80	44.30	73.00	2.54	7.21
1963	3.85	9.13	5.16	11.50	16.80	366.00	109.00	19.50	16.80	21.10	3.35	2.19
1964	2.29	2.26	1.95	4.12	2.62	276.00	436.00	16.60	15.50	10.20	2.41	2.14
1965	1.73	2.19	2.72	32.60	121.00	184.00	302.00	8.54	2.82	1.89	1.57	2.67
1966	15.00	1.75	3.80	43.50	55.50	36.70	35.30	69.50	5.62	7.69	2.20	3.92
1967	3.55	75.20	316.00	67.50	104.00	255.00	69.40	146.00	6.13	6.84	5.65	2.08
1968	2.96	11.90	312.00	146.00	121.00	97.90	61.50	118.00	112.00	6.57	36.70	3.68
1969	4.69	43.20	103.00	233.00	59.20	44.70	137.00	62.90	52.80	15.30	6.38	23.10
1970	15.60	103.00	24.90	131.00	112.00	112.00	193.00	37.90	23.00	33.90	23.60	1.89
1971	2.26	3.00	14.30	18.90	303.00	89.50	14.80	45.00	53.40	3.49	2.92	8.58
1972	9.80	4.25	189.00	74.40	20.10	141.00	424.00	48.00	31.90	27.90	4.61	237.00
1973	55.20	376.00	200.00	82.50	53.30	336.00	159.00	55.00	159.00	9.24	52.00	2.18
1974	3.67	46.40	148.00	277.00	115.00	163.00	110.00	35.30	37.00	26.50	21.20	25.40
1975	3.82	18.40	184.00	187.00	264.00	176.00	58.30	22.80	62.90	7.94	19.70	4.95
1976	25.30	16.90	103.00	227.00	312.00	122.00	11.50	10.00	40.20	13.30	3.52	2.80
1977	3.98	2.93	2.83	1.83	85.10	100.00	24.50	24.50	8.37	4.14	7.65	18.80
1978	32.60	14.40	320.00	19.80	7.60	494.00	247.00	85.90	10.30	27.70	9.16	2.97
1979	3.37	6.04	31.80	68.00	105.00	203.00	125.00	32.10	44.60	185.00	161.00	16.50
1980	19.30	248.00	103.00	34.80	59.70	311.00	95.00	17.70	187.00	22.80	32.90	3.69
1981	2.99	2.71	5.25	8.76	63.40	17.50	97.90	208.00	305.00	29.10	6.26	22.40
1982	13.40	10.90	64.70	244.00	266.00	456.00	102.00	100.00	41.40	5.20	4.15	1.34
1983	0.98	22.10	98.90	22.00	52.50	27.40	152.00	130.00	12.20	8.38	2.34	1.46
1984	9.38	109.00	131.00	11.50	132.00	245.00	266.00	34.30	8.23	38.40	15.40	4.86
1985	3.75	33.70	79.70	61.20	285.00	191.00	76.10	15.80	17.90	4.93	4.24	4.83

APPENDIX D-1. (CONTINUED)

OCT	NOV	DEC	JAN	FEB	MARCH
		TWENTY FIFTH PERCENTILE			
2.98	2.98	5.23	17.00	54.90	95.80
		FIFTIETH PERCENTILE			
3.91	15.60	81.30	64.30	105.00	180.00
		SEVENTY FIFTH PERCENTILE			
15.20	44.00	157.00	156.00	133.00	285.00

APRIL	MAY	JUNE	JULY	AUG	SEPT
		TWENTY FIFTH PERCENTILE			
52.50	22.00	11.70	6.77	3.24	2.17
		FIFTIETH PERCENTILE			
106.00	38.80	34.40	14.30	6.32	3.80
		SEVENTY FIFTH PERCENTILE			
207.00	73.60	52.90	28.20	21.80	17.10

APPENDIX D-2. STATISTICAL STREAM FLOW DATA FOR WABASH RIVER (43)

03322500 WABASH RIVER NEAR NEW CORYDON, IN

LOCATION.--Lat 40°33'50", long 84°48'10", in NE¼SE¼ sec.3, T.24 N., R.15 E., Jay County, Hydrologic Unit 05120101, on left bank 10 ft downstream from county bridge on Indiana-Ohio State line road, 2 mi east of New Corydon, 2.8 mi downstream from Beaver Creek, and at mile 466.0.

DRAINAGE AREA.--262 mi^2.

PERIOD OF RECORD.--April 1951 to September 1985.

GAGE.--Water-stage recorder. Datum of gage is 830.10 ft above National Geodetic Vertical Datum of 1929. Prior to June 24, 1953, nonrecording gage at same site and datum.

REMARKS.--Occasional regulation by Grand Lake, diversion from or into St. Marys River basin, and into Miami and Erie Canal.

AVERAGE DISCHARGE.--34 years, 202 ft^3/s, 10.47 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,720 ft^3/s Jan. 22, 1959; gage height, 20.47 ft, from floodmarks; minimum daily, 0.8 ft^3/s Dec. 22, 23, 1963.

DURATION TABLE OF DAILY MEAN DISCHARGES FOR YEAR ENDING SEPTEMBER 30

NUMBER OF DAYS IN CLASS

CLASS / YEAR	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
1952					2	4	2	11	10	10	7	13	64	24	9	8	7	14	15	6	9	20	38	32	17	14	13	4	7	2		4			
1953									1	17	21	61	35	13	19	29	15	14	21	20	21	21	14	12	10	8	3	6	2		1	1			
1954		6		3		9	2	22	50	88	33	31	27	14	19	15	13	7	6	2	2	2	1	3	2	2	1								
1955								7	17	33	29	38	35	36	17	18	22	20	15	10	11	17	7	11	6	4	8	3		1					
1956								4	11	9	41	31	21	25	42	26	15	14	14	7	8	13	20	26	14	8	9	4	4						
1957								33	22	16	14	17	9	10	13	30	9	12	17	12	16	15	38	25	11	8	10	7	6	6	5	3	1		
1958											4	13	15	13	14	24	27	16	19	19	27	51	60	17	12	7	6	5	6	3	4	2	1		
1959								5	15	19	45	20	20	27	14	18	12	13	15	23	11	9	24	20	22	8	7	3	5	2	2	4			2
1960									16	23	13	29	34	39	26	42	21	20	16	13	15	13	16	6	10	2	2	2	5	3					
1961					14	3	23	22	36	37	20	17	9	10	10	15	14	13	12	13	11	17	19	14	4	2	5	7	2	5	1				
1962							1	9	18	44	37	32	19	19	23	25	18	15	22	4	8	29	13	5	5	4	5	5	2	1		1	1		
1963						4	16	38	39	46	46	30	28	16	19	12	8	10	15	9	8	1	2	5	3	2	4	1	1		1		1		
1964		8	1		2	6	14	39	44	48	42	37	17	9	8	9	12	4	6	6	9	4	8	6	2	4	6	2	5	1	4	1	1	1	
1965						6	13	54	68	43	38	25	12	9	10	6	7	6	4	4	8	6	13	7	5	7	4	2	4	2	2				
1966				1	2	6	22	61	48	28	35	34	25	10	18	16	7	16	8	6	5	5	3	6	2		1								
1967							4	6	25	39	13	18	31	21	26	20	18	15	12	9	7	14	17	16	16	6	2	6	9	3	4	3			
1968								1	6	24	29	28	18	24	34	22	20	14	10	6	45	18	15	10	10	3	8	6	3	3	7	1	1		
1969										23	17	32	9	7	20	29	27	37	38	13	33	27	14	12	4	10	3	1	2	3	2	2			
1970									6	38	10	16	12	12	15	9	13	22	34	60	46	27	10	7	8	3	7	2	5	1	1	1			
1971								3	26	47	36	28	23	23	28	18	15	31	19	12	13	10	8	6	3	4	5		4	3					
1972									5	22	33	26	10	4	9	12	14	26	22	26	32	40	19	25	11	7	5	3	8	3	4				
1973								1	4	2	1		1	5	6	15	16	33	21	21	18	21	47	42	36	32	13	8	5	7	8	2			
1974								4	19	45	16	22	20	19	17	18	13	11	10	22	20	23	22	20	9	8	7	7	3	5	2	2	1		
1975										25	16	34	15	20	25	31	24	17	13	8	15	26	23	25	8	12	9	7	7	3	1		1		
1976								1	4	25	36	51	42	26	22	16	8	9	14	19	27	20	9	7	7	8	4	1	4	1	3	2			
1977							41	28	68	66	30	19	8	15	16	10	7	12	10	4	2	7	3	4	4	3	2		1						
1978							4	12	7	29	29	17	17	46	16	11	15	12	11	19	30	13	16	12	11	5	7	5	6	2	4	9			
1979							2	9	14	14	4	33	19	12	14	26	30	32	35	27	25	17	8	7	9	9	10	3	2	2	1	1			
1980										1	9	13	8	16	13	10	21	27	34	28	45	38	32	17	9	15	5	7	11	3	2	2			
1981									3	42	23	17	33	23	30	32	25	17	16	12	8	6	15	16	10	9	15	1	8	2		1	1		
1982								14	9	11	28	18	10	9	6	5	25	34	30	11	27	23	15	22	17	10	10	10	10	6	5				
1983								13	37	24	29	14	14	20	16	15	26	31	41	20	22	13	9	5	6	1	3	3	1	1	1				
1984								5	3	12	24	25	19	22	11	18	10	16	29	16	19	27	29	23	14	10	11	6	11	2	4				
1985									10	22	26	23	17	17	20	24	46	27	14	6	9	35	25	12	9	7	4	4	2	2		2	1	1	

CLASS	VALUE	TOTAL	ACCUM	PERCT
0	0.00	0	12419	100.00
1	0.80	14	12419	100.00
2	1.1	1	12405	99.89
3	1.4	4	12404	99.88
4	1.8	20	12400	99.85
5	2.4	38	12380	99.69
6	3.2	144	12342	99.38
7	4.2	402	12198	98.22
8	5.6	641	11796	94.98
9	7.3	972	11155	89.82
10	9.7	834	10183	82.00
11	13.0	862	9349	75.28
12	17.0	696	8487	68.34
13	22.0	615	7791	62.73
14	29.0	605	7176	57.78
15	39.0	634	6571	52.91
16	51.0	580	5937	47.81
17	67.0	617	5357	43.14
18	88.0	618	4740	38.17
19	120.0	493	4122	33.19
20	150.0	622	3629	29.22
21	200.0	628	3007	24.21
22	270.0	612	2379	19.16
23	350.0	483	1767	14.23
24	470.0	325	1284	10.34
25	610.0	247	958	7.71
26	810.0	219	711	5.73
27	1100.0	131	492	3.96
28	1400.0	156	361	2.91
29	1900.0	78	205	1.65
30	2400.0	69	127	1.02
31	3200.0	44	56	0.47
32	4300.0	10	14	0.11
33	5600.0	2	4	0.03
34	7400.0	2	2	0.02

APPENDIX D-2. (CONTINUED)

LOWEST MEAN DISCHARGE AND RANKING FOR THE FOLLOWING NUMBER OF CONSECUTIVE DAYS IN YEAR ENDING MARCH 31

YEAR	1	3	7	14	30	60	90	120	183
1952	2.20 5	2.30 4	2.80 4	3.10 4	4.40 7	5.50 5	6.10 4	8.30 6	16.00 9
1953	13.00 33	14.00 33	14.00 33	15.00 33	15.00 30	20.00 28	35.00 28	45.00 28	48.00 24
1954	5.00 18	5.40 18	5.60 17	6.20 15	7.20 16	8.10 12	8.50 11	8.60 7	11.00 6
1955	1.00 2	1.00 2	1.10 2	1.70 1	3.30 1	8.10 13	10.00 15	13.00 15	32.00 16
1956	4.50 14	5.00 15	5.30 15	5.60 13	6.60 12	9.60 17	17.00 19	26.00 22	41.00 20
1957	5.00 19	5.00 16	5.00 12	5.10 10	5.30 10	5.80 6	6.60 6	8.90 8	21.00 11
1958	8.40 29	9.10 30	11.00 30	14.00 32	20.00 32	86.00 33	96.00 33	119.00 33	249.00 34
1959	11.00 32	11.00 32	11.00 31	12.00 31	28.00 33	73.00 32	80.00 32	89.00 31	132.00 31
1960	5.50 23	5.50 19	5.80 19	6.40 16	7.70 19	8.80 16	10.00 16	15.00 17	29.00 14
1961	2.00 4	2.00 3	2.00 3	2.00 3	4.00 5	4.30 2	5.20 3	6.00 3	7.30 2
1962	4.40 12	4.90 13	5.60 18	7.30 21	16.00 31	19.00 27	31.00 27	37.00 27	57.00 25
1963	2.90 8	3.30 9	4.70 11	5.50 12	6.90 14	10.00 18	10.00 17	11.00 13	12.00 7
1964	0.80 1	0.83 1	0.87 1	1.80 2	3.50 2	4.80 3	5.10 2	5.00 1	6.80 1
1965	2.60 7	2.80 5	3.30 6	3.80 7	4.30 6	6.00 7	6.20 5	6.40 4	8.50 4
1966	2.40 6	2.80 6	3.00 5	3.20 5	3.80 4	4.90 4	7.20 8	8.00 5	8.70 5
1967	1.40 3	2.80 7	3.70 8	4.20 8	5.20 9	6.30 8	7.10 7	9.70 11	20.00 10
1968	4.80 15	5.50 20	6.10 21	6.70 18	7.20 17	8.40 14	9.30 14	13.00 16	22.00 12
1969	6.60 25	7.30 26	8.00 26	8.50 26	9.80 24	12.00 21	18.00 20	31.00 24	64.00 27
1970	7.50 28	7.80 28	8.10 27	9.10 27	11.00 25	25.00 29	44.00 30	57.00 29	98.00 29
1971	5.00 20	5.50 21	6.00 20	6.90 20	8.00 20	8.50 15	8.60 12	8.90 9	13.00 8
1972	5.30 21	6.00 22	6.80 22	7.40 22	9.20 23	15.00 23	23.00 23	22.00 19	41.00 21
1973	8.80 30	9.50 31	11.00 32	11.00 29	13.00 29	46.00 31	73.00 31	101.00 32	229.00 33
1974	4.80 16	5.00 14	5.50 16	6.70 19	6.90 15	11.00 19	42.00 29	84.00 30	109.00 30
1975	7.00 27	7.10 25	7.50 23	8.00 24	8.40 21	16.00 24	25.00 24	22.00 20	32.00 17
1976	5.50 22	6.20 23	7.60 25	8.20 25	11.00 26	25.00 30	28.00 26	31.00 25	40.00 18
1977	3.20 9	3.20 8	3.40 7	3.40 6	3.50 3	4.20 1	4.80 1	5.90 2	7.80 3
1978	4.00 11	4.10 11	4.60 10	6.00 14	7.70 18	11.00 20	11.00 18	11.00 12	23.00 13
1979	3.80 10	4.00 10	4.10 9	4.40 9	4.90 8	6.30 9	7.60 9	9.60 10	31.00 15
1980	29.00 34	31.00 34	37.00 34	46.00 34	65.00 34	104.00 34	125.00 34	164.00 34	162.00 32
1981	6.40 24	6.70 24	7.50 24	7.90 23	8.80 22	14.00 22	22.00 22	22.00 21	42.00 23
1982	8.90 31	9.00 29	9.90 29	11.00 30	11.00 27	16.00 25	25.00 25	36.00 26	81.00 28
1983	4.50 13	5.10 17	5.20 13	5.30 11	6.30 11	6.90 10	8.50 10	12.00 14	41.00 22
1984	4.90 17	4.90 12	5.20 14	6.40 17	6.70 13	7.30 11	8.80 13	17.00 18	40.00 19
1985	6.90 26	7.60 27	9.10 28	10.00 28	12.00 28	16.00 26	18.00 21	28.00 23	60.00 26

HIGHEST MEAN DISCHARGE AND RANKING FOR THE FOLLOWING NUMBER OF CONSECUTIVE DAYS IN YEAR ENDING SEPTEMBER 30

YEAR	1	3	7	15	30	60	90	120	183
1952	3810.00 16	3210.00 10	1850.00 14	1350.00 11	1030.00 13	837.00 9	745.00 6	665.00 5	519.00 6
1953	3630.00 19	1970.00 25	971.00 29	756.00 27	584.00 27	405.00 28	372.00 26	334.00 26	296.00 23
1954	968.00 33	698.00 33	369.00 33	224.00 33	179.00 33	121.00 33	94.00 33	80.00 34	61.00 34
1955	2360.00 29	1440.00 30	842.00 31	628.00 30	402.00 31	310.00 31	299.00 29	257.00 29	190.00 30
1956	1890.00 31	1410.00 31	870.00 30	687.00 29	601.00 26	569.00 21	420.00 23	360.00 23	269.00 24
1957	4720.00 5	3360.00 8	2510.00 6	1600.00 7	1340.00 4	948.00 4	800.00 2	736.00 2	578.00 3
1958	5400.00 4	4200.00 4	3390.00 2	2090.00 2	1230.00 6	794.00 11	598.00 15	483.00 16	368.00 17
1959	7790.00 1	6210.00 1	3420.00 1	1960.00 3	1530.00 2	1060.00 1	760.00 4	719.00 3	524.00 5
1960	2190.00 30	1450.00 29	1160.00 27	719.00 28	561.00 28	368.00 29	322.00 27	291.00 27	211.00 28
1961	2700.00 25	2310.00 23	1730.00 20	1330.00 13	878.00 17	768.00 13	632.00 13	509.00 13	369.00 16
1962	4500.00 8	2530.00 22	1390.00 26	823.00 26	691.00 24	605.00 20	496.00 19	384.00 19	266.00 25
1963	4700.00 6	3110.00 12	1760.00 18	1110.00 21	681.00 25	411.00 27	286.00 30	222.00 31	153.00 31
1964	5850.00 3	4580.00 3	2720.00 5	1580.00 8	1290.00 5	918.00 6	655.00 10	496.00 15	330.00 18
1965	2460.00 27	1660.00 28	1460.00 25	954.00 24	698.00 22	559.00 22	448.00 21	345.00 24	230.00 26
1966	911.00 34	596.00 34	360.00 34	195.00 34	147.00 34	87.00 34	82.00 34	85.00 33	68.00 33
1967	3800.00 17	3260.00 9	2280.00 8	1180.00 19	1040.00 11	700.00 14	646.00 11	566.00 10	484.00 8
1968	4560.00 7	3390.00 7	2220.00 9	1270.00 17	898.00 15	673.00 16	602.00 14	513.00 12	437.00 11
1969	3400.00 20	2690.00 19	1610.00 23	1180.00 18	766.00 20	528.00 24	403.00 25	367.00 22	302.00 22
1970	3240.00 21	2540.00 21	1470.00 24	835.00 25	556.00 29	436.00 26	435.00 22	381.00 21	314.00 19

APPENDIX D-2. (CONTINUED)

HIGHEST MEAN DISCHARGE AND RANKING FOR THE FOLLOWING NUMBER OF CONSECUTIVE DAYS IN YEAR ENDING SEPTEMBER 30--Continued

1971	2390.00 28	1950.00 26	1680.00 21	1010.00 22	698.00 23	460.00 25	318.00 28	286.00 28	212.00 27
1972	3020.00 22	2730.00 17	1800.00 16	1280.00 15	896.00 16	612.00 19	466.00 20	383.00 20	376.00 15
1973	3780.00 18	2870.00 15	1860.00 13	1720.00 5	1150.00 7	942.00 5	784.00 3	689.00 4	704.00 1
1974	4490.00 9	3500.00 6	2470.00 7	1660.00 6	1080.00 8	835.00 10	709.00 7	641.00 7	465.00 9
1975	4300.00 11	2940.00 14	1830.00 15	1170.00 20	853.00 18	692.00 15	634.00 12	616.00 8	442.00 10
1976	4140.00 12	2690.00 18	1770.00 17	1340.00 12	947.00 14	672.00 17	551.00 16	457.00 18	314.00 20
1977	1490.00 32	958.00 32	667.00 32	462.00 32	320.00 32	235.00 32	172.00 32	132.00 32	91.00 32
1978	4000.00 15	3780.00 5	3050.00 4	2340.00 1	1590.00 1	1020.00 3	745.00 5	657.00 6	538.00 4
1979	4020.00 14	3080.00 13	1950.00 12	1300.00 14	738.00 21	556.00 23	406.00 24	344.00 25	304.00 21
1980	4110.00 13	2810.00 16	1730.00 19	988.00 23	842.00 19	625.00 18	519.00 18	471.00 17	434.00 12
1981	4480.00 10	3150.00 11	2040.00 11	1410.00 10	1070.00 10	867.00 8	671.00 9	535.00 11	395.00 13
1982	2770.00 24	2620.00 20	2200.00 10	1560.00 9	1400.00 3	1040.00 2	877.00 1	766.00 1	581.00 2
1983	2510.00 26	1920.00 27	1100.00 28	598.00 31	509.00 30	335.00 30	247.00 31	226.00 30	200.00 29
1984	3000.00 23	2260.00 24	1680.00 22	1270.00 16	1030.00 12	894.00 7	696.00 8	575.00 9	498.00 7
1985	6400.00 2	5210.00 2	3100.00 3	1760.00 4	1080.00 9	770.00 12	539.00 17	501.00 14	386.00 14

ANNUAL VALUES

ANNUAL MEAN DISCHARGE AND RANKING IN YEAR ENDING MARCH 31

1952	254.00 26
1953	185.00 17
1954	64.00 2
1955	112.00 7
1956	141.00 12
1957	114.00 8
1958	390.00 31
1959	390.00 32
1960	179.00 16
1961	106.00 6
1962	247.00 25
1963	77.00 4
1964	68.00 3
1965	177.00 15
1966	85.00 5
1967	190.00 19
1968	257.00 27
1969	195.00 21
1970	189.00 18
1971	147.00 13
1972	126.00 9
1973	494.00 34
1974	317.00 30
1975	245.00 24
1976	193.00 20
1977	51.00 1
1978	212.00 22
1979	177.00 14
1980	295.00 29
1981	139.00 11
1982	408.00 33
1983	132.00 10
1984	226.00 23
1985	286.00 28

ANNUAL MEAN DISCHARGE AND RANKING IN YEAR ENDING SEPTEMBER 30

1952	281.00 8
1953	163.00 24
1954	35.00 34
1955	113.00 30
1956	173.00 21
1957	319.00 2
1958	314.00 3
1959	284.00 7
1960	133.00 26
1961	193.00 17
1962	145.00 25
1963	82.00 31
1964	169.00 23
1965	119.00 27
1966	39.00 33
1967	258.00 10
1968	247.00 12
1969	189.00 18
1970	187.00 19
1971	116.00 28
1972	249.00 11
1973	447.00 1
1974	246.00 13
1975	240.00 14
1976	171.00 22
1977	52.00 32
1978	289.00 6
1979	184.00 20
1980	304.00 5
1981	210.00 16
1982	312.00 4
1983	114.00 29
1984	279.00 9
1985	214.00 15

APPENDIX D-2. (CONTINUED)

NORMAL MONTHLY MEANS (ALL DAYS)

YEAR	OCT	NOV	DEC	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT
1951	*	*	*	*	*	*	277.00	179.00	37.00	17.60	5.98	6.92
1952	5.86	24.70	391.00	868.00	547.00	692.00	445.00	167.00	34.10	20.80	63.10	114.00
1953	17.00	47.70	235.00	283.00	246.00	546.00	109.00	347.00	73.10	21.30	16.60	9.89
1954	7.55	9.53	9.26	32.30	44.20	79.90	140.00	29.80	41.70	7.10	20.20	3.36
1955	101.00	59.80	112.00	239.00	259.00	344.00	98.60	29.40	44.50	31.10	11.60	38.30
1956	118.00	275.00	34.50	40.10	509.00	486.00	258.00	158.00	148.00	47.30	17.00	8.48
1957	5.32	7.91	69.30	222.00	298.00	141.00	1328.0	552.00	504.00	532.00	26.10	163.00
1958	116.00	194.00	715.00	310.00	133.00	97.90	190.00	135.00	1161.0	349.00	257.00	102.00
1959	105.00	101.00	46.60	982.00	814.00	472.00	428.00	423.00	33.90	14.70	9.25	9.12
1960	39.00	69.20	174.00	298.00	435.00	224.00	69.30	66.50	65.20	141.00	17.10	7.36
1961	7.89	8.10	5.13	5.20	192.00	689.00	792.00	240.00	141.00	43.60	143.00	51.60
1962	62.40	21.80	19.00	520.00	435.00	511.00	55.50	52.70	30.70	21.00	9.60	10.80
1963	12.30	13.00	8.34	18.40	30.10	652.00	143.00	36.70	23.80	24.40	7.00	4.24
1964	5.40	6.57	3.96	14.80	9.31	525.00	1275.0	145.00	18.20	13.70	13.20	8.04
1965	4.72	7.96	6.76	22.70	221.00	411.00	696.00	39.60	12.10	7.80	5.56	9.05
1966	19.80	4.08	5.99	54.90	. 109.00	65.70	50.10	114.00	19.50	15.10	6.69	7.90
1967	9.80	99.10	595.00	151.00	229.00	968.00	383.00	539.00	49.10	30.00	10.80	7.48
1968	9.57	26.80	868.00	439.00	468.00	243.00	123.00	453.00	204.00	34.80	75.20	11.80
1969	11.60	106.00	286.00	600.00	307.00	128.00	258.00	218.00	141.00	152.00	19.90	44.60
1970	123.00	215.00	165.00	303.00	330.00	308.00	455.00	189.00	102.00	45.50	13.10	9.07
1971	8.01	9.42	17.60	22.40	646.00	297.00	43.90	130.00	163.00	40.40	21.10	38.80
1972	20.80	9.36	448.00	277.00	120.00	195.00	851.00	350.00	116.00	134.00	14.30	460.00
1973	312.00	1144.0	727.00	466.00	409.00	959.00	515.00	113.00	325.00	80.90	237.00	78.10
1974	8.47	103.00	475.00	921.00	483.00	468.00	310.00	61.50	42.10	22.40	18.60	49.00
1975	9.18	51.30	493.00	554.00	788.00	575.00	197.00	77.70	83.60	20.90	46.10	23.90
1976	42.60	30.30	232.00	455.00	778.00	350.00	32.60	25.20	72.50	26.00	15.70	10.60
1977	9.25	7.12	5.36	3.62	181.00	234.00	79.00	35.10	13.10	9.40	13.70	47.90
1978	43.10	13.60	804.00	161.00	69.30	1216.0	707.00	247.00	55.40	104.00	12.70	5.88
1979	7.09	14.20	45.80	159.00	167.00	599.00	384.00	134.00	108.00	256.00	250.00	72.40
1980	146.00	558.00	368.00	260.00	251.00	749.00	413.00	93.30	569.00	85.90	143.00	15.00
1981	17.40	40.20	22.50	19.20	232.00	44.20	214.00	696.00	1003.0	187.00	39.50	17.80
1982	23.90	65.60	168.00	584.00	774.00	1145.0	516.00	198.00	221.00	53.60	11.80	7.17
1983	6.86	57.10	190.00	117.00	164.00	57.30	310.00	349.00	57.00	44.50	9.19	6.87
1984	34.70	322.00	453.00	89.60	297.00	732.00	1001.0	244.00	67.20	88.70	20.40	14.20
1985	29.60	158.00	351.00	225.00	811.00	477.00	340.00	86.10	91.90	22.50	12.90	8.25

	OCT	NOV	DEC	JAN	FEB	MARCH
TWENTY FIFTH PERCENTILE	7.98	9.50	18.60	38.10	166.00	217.00
FIFTIETH PERCENTILE	17.19	43.90	171.00	232.00	278.00	470.00
SEVENTY FIFTH PERCENTILE	47.90	104.00	449.00	458.00	490.00	661.00

	APRIL	MAY	JUNE	JULY	AUG	SEPT
TWENTY FIFTH PERCENTILE	123.00	66.50	37.00	20.90	11.60	7.90
FIFTIETH PERCENTILE	310.00	145.00	72.50	34.80	16.60	10.80
SEVENTY FIFTH PERCENTILE	515.00	247.00	148.00	88.70	39.50	47.90

JHRP 91/4

LEGEND

PARENT MATERIALS
(GROUPED ACCORDING TO LAND FORM AND ORIGIN)

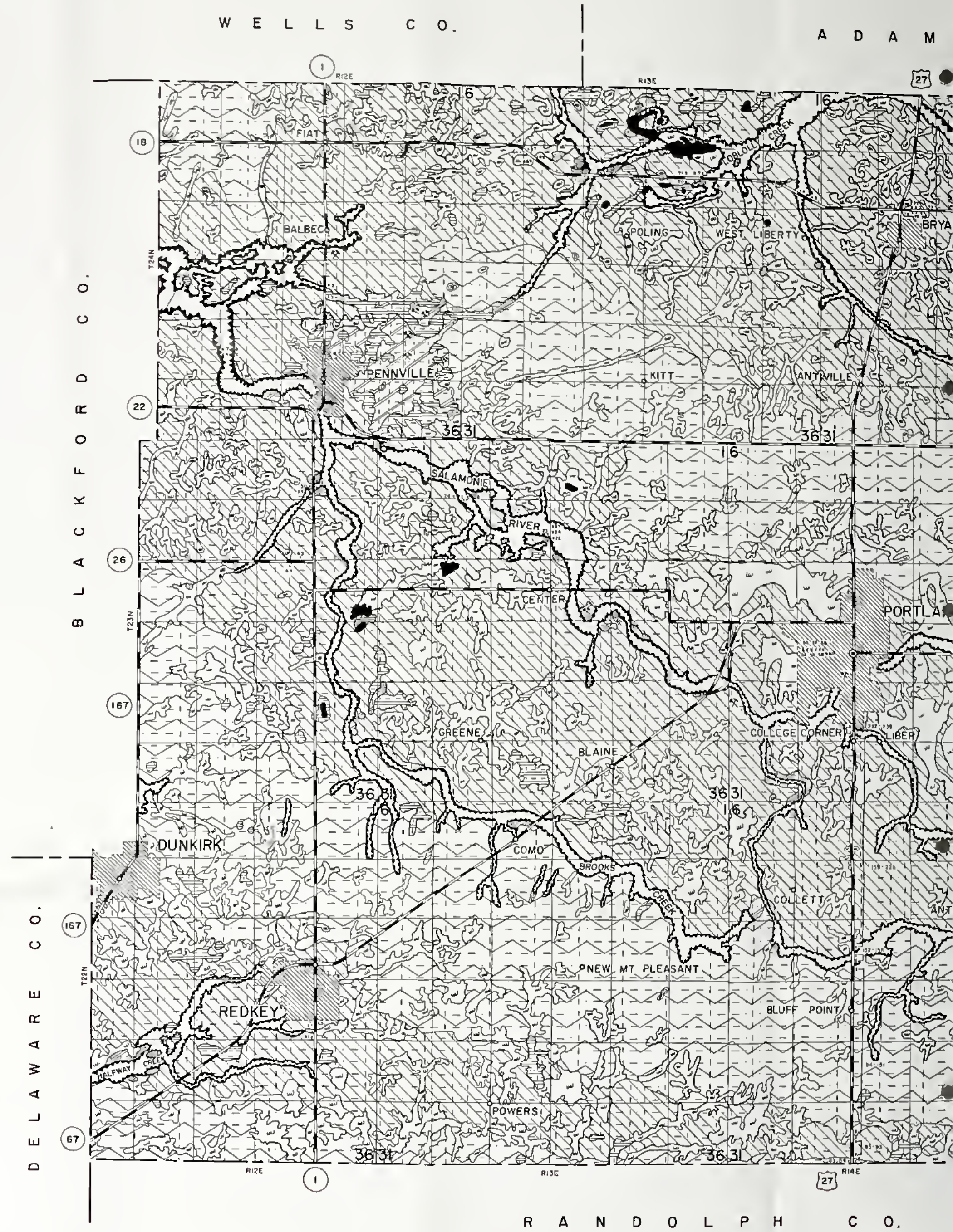
- RIDGE MORAINE
- GROUND MORAINE – WISCONSINAN
- LACUSTRINE PLAIN
- FLOOD PLAIN
- MUCK BASINS
- TERRACES

TEXTURAL SYMBOLS
(SUPERIMPOSED ON PARENT MATERIAL TO SHOW RELATIVE COMPOSITION)

- GRAVEL
- SAND
- SILT
- CLAY

MISCELLANEOUS

- GRAVEL PIT
- LAKE AND POND
- HIGHLY ORGANIC TOPSOIL
- URBAN AREA
- BORING SITE



ENGINEERING SOILS MAP

JAY COUNTY

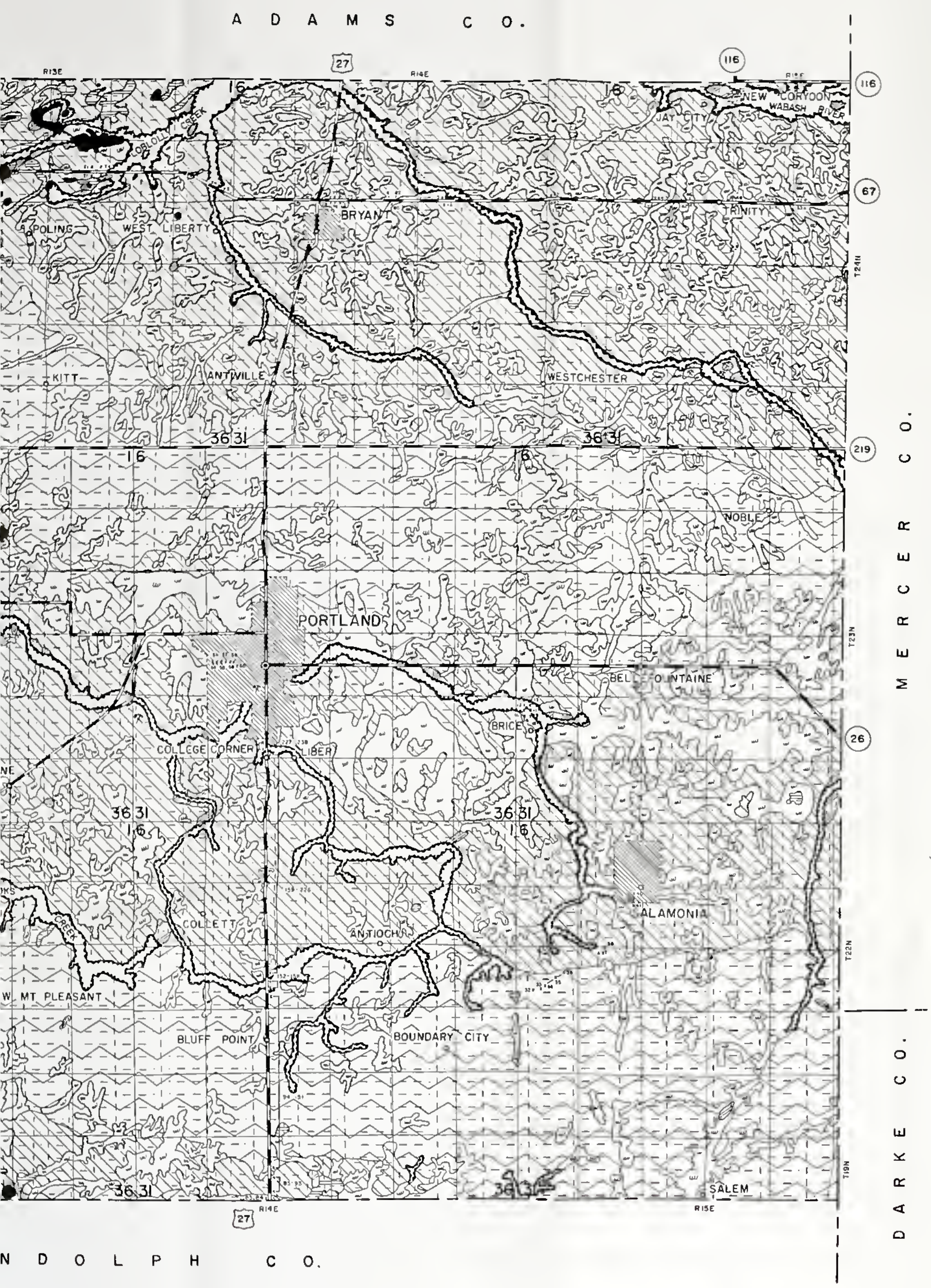
INDIANA

PREPARED FROM
1940 AAA AERIAL PHOTOGRAPHS
BY
JOINT HIGHWAY RESEARCH PROJECT
AT
PURDUE UNIVERSITY

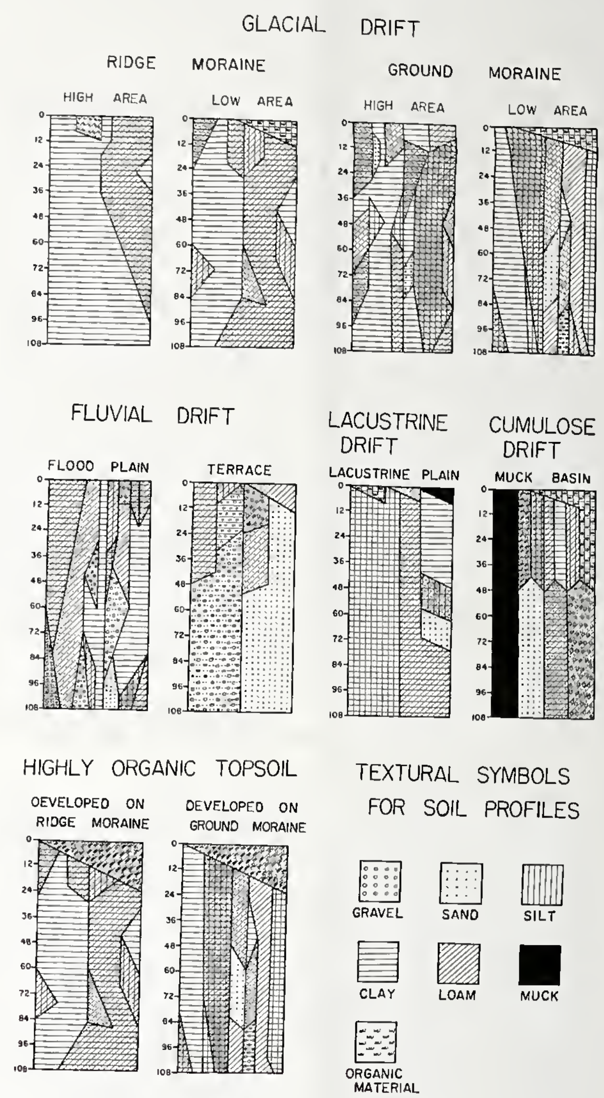
1990

SCALE OF MILES

PREPARED UNDER THE SUPERVISION OF ARVINO CHATURVEDI, ANDREW GARRIGUS, AND C·W·LOVELL



GENERAL SOIL PROFILES



EERING SOILS MAP
Y COUNTY
INDIANA

PREPARED FROM
AAA AERIAL PHOTOGRAPHS
BY
IGHWAY RESEARCH PROJECT
AT
PURDUE UNIVERSITY
1990

SCALE OF MILES

DRAWN BY D. YANG AND MEI ZHANG

COVER DESIGN BY ALDO GIORGINI